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CASE

OF

ANEURISM

OF THE

EXTERNAL ILIAC ARTERY,

FOR WHICH

THE FEMORAL ARTERY

AND SUBSEQUENTLY THE AORTA

WERE TIED.

By J. H. JAMES, Esq.

SURGEON TO THE DEVON AND EXETER HOSPITAL.

COMMUNICATED BY

JOHN ABERNETHY, Esq.

Read Nov. 10, 1829.

JOHN WINDSOR, æt. 44, a man of rather spare habit, but not otherwise unhealthy appearance, was admitted May 7th, 1829, into the Devon and Exeter Hospital for disease of his left hip and knee. He had been ill about four months;—he was lame;—there was flattening of the nates, and pain about the hip joint and in the knee, which was evidently swollen; but there was no tumefaction either below or above Poupart's ligament. He made no mention of any swelling at that time, but it since appears that he had perceived one in the lower part of the abdomen four months before his admission. Upon the outside of the thigh and nates were marks of two large blisters.

Under the persuasion that this was a case of diseased hip-joint, I ordered rest and an issue behind the trochanter; and when towards the end of the month, I remarked a tumour at the lower part of the abdomen above Poupart's ligament, I was led to believe, that it might proceed from an enlargement of the iliac glands, induced by the irritation of the diseased joint. It increased, however, with great rapidity, and on desiring my colleague, Mr. Barnes, to look at it, he ascertained it to be an aneurism.

The tumour at this time did not at all rise at the pulsations, but when firmly pressed, part of its contents could be emptied, and when the pressure was removed, the blood returned with throbbing: no pulsation was perceptible in the groin or ham; neither was there any coldness of the limb;—a degree of numbness was felt, so slight, however, as to be little noticed; but he complained of much pain in the knee: the stethoscope further declared its nature.

The tumour continued to increase fast; and in the beginning of June it occupied the whole of the iliac region, and projected the lower part of the abdomen considerably. No operation could be performed above the tumour with much probability of success;—and the only one feasible, was that of Brasdor, revived by Mr. Wardrop, on which I determined, notwithstanding an apparent ob-

jection; namely, that from the total absence of pulsation in the groin, it was doubtful whether the stream of blood was not altogether intercepted. The want of pulsation, however, I may here add, appears to me, to be no proof of want of circulation through the artery below the sac, for I am much disposed to believe that the blood, in this case, may flow through it, much in the same way as it does through the veins; the impulse of the heart being lost in the one case on the small arteries, in the other, on the sides of the sac.

The man's constitution was not impaired by hard living;—the pulsation of the heart and arteries indicated no aneurismal diathesis; and he could assign no probable cause for the production of this disease.

June 2d. The patient being laid a little on his side, and having measured exactly half the distance between the spine of the ilium and the symphysis pubis, I made an incision over this point, from a little above Poupart's ligament, to about three inches down the thigh; a large gland then presented itself, which was dissected to the inside; underneath this, the crescentic edge of the fascia lata was visible, which I also divided; I then proceeded, chiefly with my fingers and nails, to separate the parts till I reached the sheath of the vessels, which was at a considerable depth; this I scratched through with a silver knife, and bared the artery,

under which I passed Weiss's needle, and tied it about half an inch below Poupart's ligament.

An operation it may be remarked, beyond an aneurismal sac, is a little embarrassed by the circumstance, that where there is no pulsation before the skin is divided, the surgeon must trust to measurement. In this case it perfectly answered.

The wound was brought together by one suture and sticking plaster.

Four hours after the operation the man was tranquil, and the bulk of the tumour appeared to be less. At nine P.M. there was a diminution of not less than three quarters of an inch, as well as I could ascertain by measurement, in the following way; namely, by carrying a piece of tape from the centre of the groin to the umbilicus, which was done before the operation, and when measured afterwards, allowance made for the thickness of the dressings.

June 3d. Going on well in every respect.

June 4th. A blush around the wound, arising from the formation of some matter in the course of the ligature, which was confined: by cutting the suture, and separating the edges, it was evacuated, and light dressing and poultices being applied, the inflammation subsided.

At this time the diminution in the measure of the tumour was fully an inch. The temperature of the limb had been uniformly good; no increase of numbness or any inconvenient feeling: his general health little disturbed, but weak, and his pulse small and weak, from 80 to 90 in number.

From this day the tumour again began to increase, but up to the 12th it had not exceeded its measurement before the operation; it had, however, began to show a disposition to point at its lower and outer part. The quantity of nourishment had been throughout as much limited as possible, but the state of his pulse did not seem to authorize blood-letting.

On the 24th, the integuments had become tense and shining, and there was considerable pain. The health hitherto had not been much disturbed, but now evidently suffered; he looked haggard, and felt ill.

The tumour, after this, increased fast in all its dimensions, more particularly at the part before mentioned, where the integuments soon became dusky red, and œdematous; and it was evident that sloughing could not be remote; at the same time the increase of the tumour towards the umbilicus rendered it imperative to take some step without further delay, if it were even proper to do

so, and under these circumstances I called a consultation for the following day.

It has been fully proved, that in cases of aneurism generally, the chance of success is much increased by the early performance of the operation; in a similar case to the present, we have the authority of Sir Astley Cooper in its favour; who regretted that he had not tied the aorta earlier. I could not, however, divest my mind of the belief, that while there was the most remote chance of a spontaneous cure taking place, it would be better to try that chance, than an operation the most formidable that could be conceived. The progress of events, however, now shewed that there was no longer any prospect of relief in that way, and consequently I felt it my duty to try the only mode left, if the patient concurred.

Operation for Tying the Aorta.

July 5th.* About half past three, the man was placed on the table, with his shoulders slightly raised, the bowels having been previously thoroughly emptied.

I made the incision rather lower than in Sir A.

* There were present at this operation, my colleagues, Dr. Miller, Mr. Luscombe, Mr. Barnes, and Mr. Harris, besides other medical gentlemen of this city.

Cooper's case, beginning it an inch above the umbilicus, and continuing it two inches below. I scratched through the linea alba below the umbilicus, and then proceeded to open the peritoneum nearly to the same extent as the external wound. This first part of the operation was somewhat impeded by very copious bleeding from the vessels of the integuments.

As soon as the division of the parietes was effected, the viscera protruded, and the efforts of the poor fellow continuing strong, I soon found myself embarrassed with almost the whole of the bowels: nearly all the colon, and a great part of the small intestines being pushed out, and presently quite distended with flatus, a circumstance frequently remarkable in the operation for strangulated hernia. I found the aorta without difficulty, pulsating strongly, but it was surrounded with dense cellular membrane, and a strong peritoneal covering was likewise interposed between my nail and it.

I may remark that even in the dead subject, it is sometimes a difficult matter to force the nail and finger between the aorta and the spine; in this case, embarrassed as I was by the coils of intestine, in which my hand was buried, it was particularly so. I enlarged the wound, but it was of little service; to have obtained sufficient room to

push aside those inflated intestines would have required an incision of enormous extent; and supposing this made, there would hardly have been a probability of retaining them completely within the abdomen by any mode of suture during the exertions which the patient might make, and which it would probably be impossible to prevent.

I endeavoured cautiously to get the point of the aneurismal needle through, and succeeded; but when it reached the other side it broke at the handle, which, in the one I had selected for its curve, was unfortunately of wood. I had little anticipated occasion for so much force. The broken part was so sharp that I was obliged to withdraw it, for fear of injuring the intestines. With some additional difficulty I got my finger, with Weiss's instrument upon it, under the artery; but even after this was effected, it was by no means easy, with the best assistance of my colleagues, to extricate the short needle bearing the ligature, so much did the intestines interfere with every kind of manipulation. When the ligature was underneath, I kept the intestines out of the way with the fingers of both my hands, and placed one of my thumbs on the vessel, whilst Mr. Luscombe drew it, first on my thumb, and then on the artery; by this I prevented any thing from being included, a caution which Sir A. Cooper has particularly dwelt upon. The ligature was then drawn tight, and the tumour became flac-

cid; at the same time the patient complained of deadness in the lower extremities. The ligature was cut close.

From the tension of the muscles and the inflated state of the intestines, they were not easily returned; but when they had been replaced, five needles were passed through the integuments, and the wound having been secured perfectly by the quill suture, large straps and a bandage were added, and the man was put to bed.

During the operation he suffered very much, and was at times extremely faint; small quantities of brandy and water were therefore given: after which a dose of laudanum in brandy and water. This appeared to revive him, but he complained of great pain in both the lower limbs, which on the aneurismal side soon increased to agony, and although opium was repeatedly given, it did not cease till he died. He also complained of pain in his head, and that light distressed him.

The temperature of the lower limbs was maintained as much as that of the trunk, but it fell in both, and about seven P.M., the same evening, he expired, complaining as much of the agonizing pain in the leg, (chiefly at the knee,) as he had done from the time of the operation.

Examination of the Body.

July 6th.* At 10 A. M. the body was opened, and the following account contains a summary of the facts then and subsequently observed.

The tumour was considerably collapsed, and the discolouration on its surface gone. The wound measured four inches.

On opening the abdomen, a considerable quantity of blood, partly coagulated, was found in the cavity among the intestines: this may have proceeded either from the vessels of the parietes, which bled copiously, or from a small branch, which during the operation was observed to be wounded in one of the under folds of the mesentery, scratched, most probably, with the handle of the broken aneurismal needle. It would have been better to have secured this at the time, though it involved the necessity of placing another ligature within the abdomen. There was no perceptible injury of the intestines; they were still distended with air. After pushing aside many convolutions, I arrived at the aorta, round which the ligature was firmly drawn, at a point which by measurement was five lines below the inferior

* Mr. Luscombe, Mr. Barnes, and Mr. Harris were present at the examination, besides other medical gentlemen.

mesenteric artery, and eleven above the bifurcation of the common iliacs. It was about an inch below the duodenum.

In the ligature were also included some very dense cellular membrane, and a small vein which was traced along the coats of the aorta, and terminated in the inferior mesenteric. This we all supposed at first to have been a nervous filet, and believed that it might have explained the extraordinary pain he felt. The vena cava was quite free and unhurt.

The aneurismal tumour was of enormous size, extending, even in its collapsed state, from the upper part of the thigh, to the side of the vertebral column, and filling the whole of the ilium. It projected on one side far into the pelvis, and on the other occupied the lower back part of the abdomen. The ilium on which it rested was perfectly bare and scabrous, and absorbed nearly through to the acetabulum; indeed hardly any of the pubis on that side was left, as far as the symphysis*.

The outer and lower part of the tumour where the sloughing was threatened, was very thin, the

* It is not improbable that this affection of the bone may have produced the symptoms which were attributed to diseased hip-joint.

walls being formed by the attenuated muscular fibres and skin, and it was torn in removing the tumour. At this part the blood was fluid and grumous; the sac elsewhere was thick and dense, *and the peritoneum adhered most firmly to its anterior surface.*

The weight of the tumour was three pounds fourteen ounces and a half.

The following was the state of the vessels. The division of the aorta into the common iliacs natural: that on the left side could be followed to its division. The internal iliac was natural, but the external was immediately implicated in the tumour, along the anterior surface of which it ran, and could be traced, broad and flat, about two-thirds its length, at which point it was abruptly lost.

On opening the sac, no traces of the posterior part of the artery could be found at this point, but about an inch and a half lower down, it was again recognized, forming a pouch, out of which proceeded the femoral arteries.

The sac was for the most part filled with concentric laminæ of organized fibrine, but it also contained much coagulated and some grumous blood.

In the aorta there were some diseased spots, but the lower part of the external iliac, which formed the pouch before mentioned, was thickened and diseased in the highest degree.

With respect to the arteries below the sac, the following circumstances were observed. The external iliac did not terminate in the common femoral as usual, but gave off two trunks of nearly equal size, and from the inner, which corresponded with the profunda, the epigastric was given off.

The ligature had been applied to the superficial femoral, about half an inch, or rather more, below a point which corresponded with the situation of the epigastric; above the ligature was a perfect clot, reaching as high as the external iliac; below it were the remains of a clot which had been disturbed by a probe. At the point of ligature, the artery was completely obliterated, and a large quantity of dense lymph was deposited externally, so as fully to restore the apparent size of the artery viewed from without; through the lymph passed the thread of the ligature to the noose, which was completely and firmly buried in it.

In the aorta, the appearance of clots both above and below was imperfect. The short time which

intervened before death, perhaps prevented their being firmly formed.

The hip-joint was examined, but there was no clear evidence of disease within it.

Having now stated the principal circumstances which belonged to its history prior to the man's death, as well as those appearances which were remarked after it, I shall proceed to offer a few observations which naturally suggest themselves.

I have to express my regret that I was in the first instance deceived as to the nature of the case, marked as it was by the symptoms of diseased hip, which were further confirmed by the evident disease of the knee. I do not, however, think that the poor fellow's fate was materially influenced by my not having ascertained the existence of aneurism at the time of his admission, for it appears that I could not then have tied the external iliac, excepting where it was either highly diseased, or implicated with the tumour. I may add, that my mind was also so much satisfied with the reasoning and facts adduced by Mr. Wardrop, that I certainly should have been induced to have given his operation a trial. Nor can I think that the result of this operation will prove unfavourable to Mr. Wardrop's plan; for it is evident, that a considerable and satisfactory alteration was pro-

duced by tying only one of the trunks which led from the iliac, and had the distribution been natural, it is not improbable a cure would have been obtained.

With regard to the second operation, I should say, that if I could have placed a ligature round the common iliac instead of the aorta, I should have much preferred it; and it was an object I kept in view. Indeed it was on this account that I made the chief part of my incision below the umbilicus, which gave me the power of proceeding in either way, as circumstances might permit. If then it be asked why I did not rather attempt the operation from the side of the abdomen, in the way Dr. Stevens and Mr. Atkinson tied the internal iliac, and which has also been recommended by Sir Astley Cooper subsequently to his operation with reference to the aorta, my answer is as follows:

This mode of operating, which is calculated to obviate the necessity of opening the peritoneum and exposing the bowels, can only succeed in those cases where there is no adhesion of that membrane; but in this case I thought it highly probable that adhesion did exist, and the examination after death verified the supposition. It would have been absolutely impossible to have detached it; and I think it will be conceded, if it

is necessary to open that sac at all, that the aorta is much more easily reached through an opening below the umbilicus than in the side; and with reference to the common iliac, that it would be quite as easy to trace it from the aorta downwards, as from the sac upwards. In the present case, the difficulties which arose from the protrusion of intestine, and the immense elevation of the tumour, prevented me from commanding the common iliac in such a way as would have enabled me to tie it in safety in a reasonable time. But where obstacles did not exist to such a degree, I can easily believe that this might be effected, and that there would be less chance of implicating the ureter, than if tied at the lower part.

In the cases to which I have referred, there was no deviation from the natural structure of the parts within the abdomen, the diseases for which these operations were performed, being more or less remote. But I believe it will be found, that where there is an aneurismal tumour on the hollow of the ilium, and the peritoneum adherent, it will most materially interfere with any operation in this situation.

The great difficulty I experienced in this case, (and it has been a common one in many species of aneurism,) arose from the opposition afforded

by the tough investments of the artery, which I could hardly pierce with my nail; and I think it must have occurred to many surgeons to find, that the nail, after it has been moistened some time, as during an operation it must be, loses considerably of its firmness. It struck me, on this occasion, that a perfectly safe instrument might be devised to remedy such inconvenience in operations on parts deeply seated. A thin ring of silver, ivory, or horn, might be adapted to the distal joint of the forefinger, which at the back might be continued on in the form of an artificial nail. It would not deprive the finger of the power of touch, while it would arm it with sufficient force to make its way through any investment. This might be put on at any period of an operation.

As to the immediate cause of death in this case, it may be remarked, that the shock of so great an operation might well sink a man whose strength was already much impaired, but he revived decidedly after it; and when I left him it was not entirely without hope, though my anticipations could not be very sanguine, considering the time and the degree to which the intestines were exposed, independent of the effect of the ligature. The symptom which most demands elucidation

was the terrible pain in the limb, which seemed far to surpass that of the operation. For this I can assign no adequate reason, nor did the examination of the body afford any, at least as far as I could with the utmost care discover. There was no evidence, during the time he lived, of the circulation below the ligature having failed.

AN ACCOUNT

OF THE

REMOVAL OF A TUMOUR

SITUATED ON THE CHEEK.

By JAMES BARLOW, Esq.

SURGEON, BLACKBURN, LANCASHIRE.

Read Jan. 12, 1830.

IT is presumed the following case, together with the annexed observations, which excited a difference of opinion amongst the surgeons consulted regarding the propriety and safety of the operation, will be thought worthy of publication, in as far as it may, at least, lead to a more correct mode of discriminating between the practicability and impracticability of excision with safety, in those more complicated morbid tumours situate in the region of the face or neck.

It is now about eighteen months since I was first consulted by Mrs. Taylor of Chorley, ten miles from hence, and in her forty-fourth year of

age, respecting a tumour on her cheek, which she informed me made its appearance nine years ago, after accidentally biting the mucous membrane of the mouth, which incident produced a small painful swelling on the part; the surgeon then employed made an incision into it, and much bleeding followed; the wound, however, soon healed, and the tumour progressively increased in size, and distended the muscles of the cheek outwardly. A perpetual blistering plaster was then applied on the part, and kept open for two weeks, but without producing any evident reduction in the bulk, or change of structure in the tumour, from which time it continued gradually spreading over the cheek, assuming a more formidable and disgusting appearance, till the time of the operation.

She also stated to me, that during its progressive state, she had consulted some of the most eminent practitioners in the neighbouring towns on the propriety of its removal. The unanimous result of their opinions was, that no operation could be effected with safety.

The tumour, at this time, extended anteriorly from the inferior edge of the right orbit, down the cheek, hung pendulous over the contour of the lower jaw, and laterally, from the angle of the mouth to near the tragus of the ear, and was remarkably prominent exteriorly.

At one period of its growth it pressed so much inwards on the gums, that mastication was accomplished with difficulty, insomuch, that she submitted to have all the molar teeth extracted from each jaw by the attending surgeon.

On passing the finger of one hand into the mouth, and applying those of the other externally over the surface of the tumour, the intervening morbid substance appeared slightly moveable, though tense, and rather elastic to the feel; its basis posteriorly adhered to the mucous membrane of the mouth, and it was very painful on pressure.

The integuments of the cheek were very thin and presented a pale glossy aspect, and the main surface of the tumour was covered with a network of varicose veins. The neighbouring glands did not appear to have sympathized with the disease.

The facial artery was perceived to beat actively on that part where it passes over the lower jaw.

From the situation and size of the tumour, and the date of its commencement, it was to be suspected that it had become attached and entoiled with important contiguous structures, such as the

parotid gland and duct, the diversified ramifications of the nerves, arteries, and veins of the neck and cheek. These exposed parts, together with the thinness of the integuments, and apparent difficulty of dissecting the morbid substance from the lining of the mouth, without penetrating the partition, were considerations, when coupled with the fear of hæmorrhage, and a reproduction of the disease, that no doubt influenced the surgeons previously consulted on the case, to abandon any hope of a favourable issue by excision.

Under these impressions, I was led to try the external use of iodine, from which I have frequently witnessed very beneficial effects, particularly in dispersing tumours seated about the neck, but this, like every other means used, eventually failed, and no hope remained except that of removal with the scalpel. The woman evinced a great desire that I would without further delay undertake the operation; and her general health appearing favourable, I consented to her entreaties, and she came to reside near Blackburn, that I might attend her more conveniently.

The 12th day of March last being fixed upon for the operation, I had her seated on a chair, with her head reclining on the breast of an assistant, and favourably placed to the light, and in the presence of Messrs. Dugdale, Barlow, Pickop,

Cocker, surgeons, and several other attendants, I commenced the operation at the upper part of the tumour, a little below the orbit, by making two incisions, extending downwards to near the basis of the lower jaw, meeting superiorly and inferiorly, and including in the ellipsis the most prominent part of the tumour. On attempting to dissect out the diseased mass from the adhering integuments, a profuse hæmorrhage followed each cut of the scalpel, and a sudden and death-like syncope seized the patient, which continued for the space of several minutes, accompanied with a feeble tremulous pulse, cold sweats, ghastly countenance, and suspended respiration. The knife was now laid aside, and the elliptical portion of the tumour instantly and firmly grasped between the ends of the fingers, by which manœuvre the bleeding was repressed, and the woman gradually revived, on repeatedly dashing cold water on the face; though much both venous and arterial blood was unavoidably lost during this stage of the operation *.

* To have attempted to tie these enlarged blood-vessels singly at this perilous period, and whilst the woman remained in a state of apparent exhaustion, would have been an hazardous adventure, and occupied so much time, that in all probability she would have expired, either from excessive hæmorrhage, or the gravitation or absorption of air into the divided evacuated veins in a way similar to that of the lady whose case forms a sequel hereto.

The dissection was then resumed by separating the skin and cellular tissue from the tumour, and to avoid making an opening through the membranous septa of the mouth, the cutting-edge of the knife was directed towards the diseased substance, and its whole circumference detached from its extensive adhesions, by drawing it forwards with the fingers of the left hand, whilst the scalpel was employed by the other in completely removing the tumour from its basis. After which the state of the mouth was examined, by passing thereinto the finger of one hand, and another of the other into the wound, where the parting membrane was found scarcely to exceed one line in thickness, from the edge of the masseter muscle to near the angle of the mouth; and though the parotid duct was fully exposed in the operation, it escaped being wounded with the knife, or its functions in any respect obstructed.

After securing several arteries with ligatures, which bled freely, the integuments were brought into apposition and retained by a few sutures, leaving a small opening at the bottom for an outlet to any accumulation of fluid which might collect during the healing of the wound; some shreds of adhesive plaster were then placed between each suture, and a pledget of lint spread with cerate applied thereon, over which a suitable bandage was several times turned to secure the whole. The

woman was then conveyed to bed, and expressed her gratitude to those around her for their assistance on the occasion.

In a short time after the operation, and when the re-action of the system was restored, a slight hæmorrhage occurred*, to repress which it became necessary to remove the dressings and cut out two of the sutures before the bleeding vessels could be secured; this being effected, the wound was again closed and dressed as before.

She now complained of excruciating pain of the cheek, probably from some nerves having been unavoidably included in the ligatures, to allay which, thirty drops of liq. opii sedat. were given in a little water, and in a short time she became easier and passed a tolerable night, though with little sleep. The wound was first dressed on the third day subsequent to the operation; the integuments were found chiefly united by the adhesive process, and healed rapidly without interruption, leaving only a very trifling disfiguration of the cheek, with a mere cicatrix on the site which the tumour had occupied.

Fortunately no contortions or paralysis super-

* In all probability this occurrence arose either from the labial or facial artery, which, in consequence of the syncope, had been overlooked when closing the wound.

vened, a circumstance which has occurred to me oftener than once after operations on the neck and cheek.

Little or no constitutional disturbance took place during the progress of the cure, and the woman returned home to her family completely well in three weeks after the extirpation of the tumour.

On inspecting the part at the present time, (nine months subsequent to the operation,) there appears no indication of the disease ever being reproduced, and the cheek has recovered its former appearance, except the remaining cicatrix, and a small depression occasioned by the unfortunate extraction of the molar teeth in the early stage of the disease.

After the operation was over, a section of the morbid tumour was made with the scalpel, and it seemed to all the medical attendants present, to partake of that character usually designated "medullary sarcoma," and bore a great affinity to the brain both in colour and texture.

After reciting the above case, which bears some affinity to the following observations, I cannot willingly quit the subject without calling the attention

of the Society to an instance of danger, (almost unknown amongst surgeons, even in the present century,) to which patients are exposed when undergoing operations about the neck, and which circumstance merits elucidation from the physiological and pathological enquirer.

The experience I have had in this department of surgery fully convinces me that whatever are the characters of tumours, or under whatsoever classification they may be arranged by nosological authors, when attached to important structures of the neck, whether in their incipient or advanced state, they eventually become more dangerous by excision, than such as are stationed on other parts of the body more distant from the heart, where the blood-vessels and nerves are more sparingly distributed; hence, I trust, a brief account of the following unfortunate case of Tumour on the Neck, which occurred to me more than thirty years ago, will be deemed worthy of perusal, and I feel the more inclined to give it publicity at this time in consequence of having lately seen the statement of two parallel cases, the one by M. Dupuytren, of Paris, in the Medico-Chirurgical Review for 1825, page 218; and the other, though not fatal, by Dr. Mott, Professor of Surgery in the University of New York *.

* See a late number of the said work.

An attempt to remove a Tumour seated on the Neck.

Mrs. Beardsworth, a delicate married lady of this town, consulted me respecting a tumour seated on the side of the neck, which had been progressively increasing in size for several years; its basis was very extensive, and occupied the whole of the lateral and posterior part, extending downwards from the ear to near the sternum and clavicle, and sidewise from the thyroid gland to the sterno-mastoid muscle, under which a part of the tumour was situated; its weight and bulk had rendered it insupportable, its texture was firm and immoveable, with hard tuberous surface, but it was not painful on pressure.

Reflecting on the extent and situation of the tumour, and the delicate and reduced state of health under which the patient had long laboured, and its probable attachments to vital and important parts, I did not urge an operation, though much importuned, both by herself and friends. The lady then took the opinion of an eminent and experienced physician from a neighbouring town, who thought its removal might be effected with safety, and she being thereby influenced, I became again solicited to perform the operation, to which I consented, though more, I must say, in compliance therewith, than from any probable expectation of eventual success.

The day for the operation being previously fixed, and every requisite preparation in readiness, I had the patient seated on a reclined chair, supported by assistants, and in the presence of the physician above alluded to.

I began the incisions with the scalpel a little below the ear, carrying them downwards over the tumour to the extent of not less than ten inches, and meeting in a line below the angle of the under jaw, leaving a portion of integuments between each incision so as to form an ellipsis; when on proceeding to dissect the skin aside to get at the basis of the tumour, a sudden and unexpected hissing gurgling noise rushed obviously from a large divided empty vein *, and the patient expired instantly, without either sigh, groan, or struggle, and every effort used to restore animation became fruitless. This unexpected event was truly appalling to all present, for scarcely an ounce of blood was lost on the occasion, and her death was then wholly attributed to a state of debility and syncope, which opinion, I acknowledge, remained unchanged till I accidentally met with the under-

* It has been noticed by authors that the veins about the neck are sometimes found irregularly distributed, and whether the incised vein, in this case, was the external jugular, or an anomalous variety, is not easy to say, for its calibre much exceeded that vessel in its natural state, and appeared flabby and empty. The instant the atmospheric air gained access and filled the vacuum, the hissing noise ceased, the patient expired, and the mouth of the vessel collapsed.

mentioned case by Dupuytren, &c. and the striking analogy which they bear to each other has induced me to transcribe the whole narrative as stated in the work before alluded to, together with the examination of the body after death, which manifestly discloses to my mind the real cause of death in both instances.

" On the 19th of November, 1822, a fine young woman (Alexandrine Poirier) came to the Hotel Dieu, for a tumour of some size, situated on the posterior and lateral part of the neck. From its hardness, renitency, and insensibility, M. Dupuytren ascertained that it was of a cellulo-fibrous nature, and proposed its removal, to which the young woman consented. The operation was performed on the 22d of November, with all the skill and dexterity of that celebrated surgeon. No arteries were cut that required the ligature, and consequently there was very little hæmorrhage. Neither were there any muscles or large nerves divided. Just, however, as he was proceeding to separate the last shreds of attachment, and turn the tumour out, he was surprised to hear a somewhat prolonged hissing noise (sufflement prolongé) similar to that produced by the re-entrance of air into a vessel from which it had been exhausted. The operator stood for an instant astonished, and observed, that, were it not for the distance of the knife from the air passage, he would have thought that he had made an opening into it. He had

scarcely said the word, when the young woman cried out that she was dying, and instantaneously dropped down on the floor a lifeless corpse, to which all their efforts could not restore the slightest symptom of animation. This happened in the presence of nearly 400 spectators, and the body was examined next day, in the presence of full as many, with the most rigorous minuteness. Every part of the body was carefully dissected, but there was not a particle of morbid structure any where to be found. An examination of the heart, however, disclosed the cause of the melancholy catastrophe.

"The right auricle was distended like a bladder with air, which rushed out when cut open, without any admixture of blood. Fluid blood was found in the other cavities of the heart, as also in the different vessels. Great quantities of air were found in all the vessels. There was no other unnatural appearance in any part of the body."

On this important case the Editor of the Medical and Chirurgical Review observes, "We have not the smallest doubt, that Dupuytren was perfectly correct in his conclusion, that air had rushed in through one of the veins of the neck, and thus caused instant death. We think it a pathological fact, however, which bears on the physiology of the circulation.

"It proves that the heart acts as a sucking, as

well as a forcing pump, otherwise air could never have passed from a cut vein in the neck down into the right chambers of the heart.

"It is highly probable, that, in consequence of the morbid state of the parts, the mouth of the cut vein had remained patulous *, and thus readily admitted the air."

The other case related by Dr. Mott, Professor of Surgery in the University of New York, which though not fatal, fully corroborates the opinion formed by myself and M. Dupuytren, as well as the Editor of the Medical and Chirurgical Review, of the cause and danger attending the division of veins in the vicinity of the neck. Hence, I feel it incumbent on me, in this place, to quote the sentiments and deductions of so eminent a surgeon as Dr. Mott :—

"In an attempt which I made to remove the parotid gland in an enlarged and scirrhous state, the facial vein, where it passes over the base of the lower jaw, was opened in dissecting the integuments from the tumour, in the early stage of the operation, before a single artery was tied. At the instant this vessel was opened, the attention of all present was arrested by the gurgling noise of air passing into some small opening.

* This state of the incised vein bears exactly the resemblance of that of the case of Mrs. Beardsworth before-mentioned.

"The breathing of the patient immediately became difficult and laborious, the heart beat violently and irregularly, his features were distorted, and convulsions of the whole body soon followed to so great an extent as to make it impossible to keep him on the table. He lay upon the floor in this condition for near half an hour, as all supposed in articulo mortis.

"As the convulsions gradually left him, his mouth was permanently distorted, and complete hemiplegia was found to have ensued; an hour or more elapsed before he could articulate, and it was nearly a whole day before he recovered the use of his arm and leg. From a belief that these effects arose from the admission of air into the blood-vessels, which was not doubted by any person present, I instantly called to mind a set of experiments which I made some twenty years since upon dogs, by blowing air into the circulation, by inserting a blow-pipe into a large superficial vein upon the thigh, and was forcibly struck with the similarity of result."

On referring to the Physiological and Pathological Researches of my friend, Dr. Blundell of London, I find some experiments related of the introduction of air into the blood-vessels of dogs, from which (and the fore-mentioned cases) it appears that the entrance of even a few drachms, though introduced at a distance from the heart, and whilst the

animals were in perfect health, eventually produced considerable distress and danger.

Hence we may conclude, when extirpating morbid tumours seated about the neck, where the veins are frequently enlarged and superficial, and the parts subject to organic derangement of structure, and the patient at the same time labouring under a state of mental anxiety and constitutional debility; that under these unfavourable circumstances, if a large vein be opened and syncope ensue, the danger becomes manifestly alarming; and to avert such incidents, where there is reason to anticipate mischief, would it not be prudent on the part of the surgeon, when commencing such operation, either to apply pressure on the visible veins which appear in the way of the knife, or secure them by one or two ligatures either effectually or only during the time of the operation? whereby the operator would be secured from fear and the patient protected from danger. Reflecting on the foregoing cases, I have lately been struck with the danger to which, in the course of a long practice, I have frequently been exposed when operating on tumours of this description. It looks now more like a dream than a reality, and it makes me almost shudder when meditating on past occurrences, from which I should now almost shrink, when urged to remove tumours seated about the neck, such as I at one time had no hesitation of undertaking, though I have been uniformly successful,

except in the case of Mrs. Beardsworth above related.

I trust that the above recital, which I have judged requisite to lay before the public, will be deemed so far important as to stand on record for a beacon to guide the practical surgeon on his way, and also excite some one more equal to the task than myself to elucidate the immediate cause of death, in such deplorable instances of surgical exigence.

Blackburn, Lancashire,
December 28, 1829.

A CASE

OF

UNUNITED FRACTURE OF THE THIGH-BONE,

CURED

BY THE APPLICATION OF A SILVER WIRE

BETWEEN THE FRACTURED EXTREMITIES.

BY DR. SOMME', M.D.

PRINCIPAL SURGEON AND PROFESSOR IN THE CIVIL HOSPITAL OF ANTWERP.

COMMUNICATED BY J. H. GREEN, ESQ. F.R.S.

ONE OF THE VICE-PRESIDENTS OF THE MEDICO-CHIRURGICAL SOCIETY.

Read Jan. 26, 1830.

AN Indian of Madras, a sailor on board the James Scott, whilst in the port of Antwerp, fell from the height of twenty feet, and fractured his left thigh; he was conveyed to the Civil Hospital on the 17th of February, 1828. He appeared to be about thirty, or thirty-five years of age.

The fracture was oblique, and situated about the middle of the thigh; the usual treatment, with two long lateral and a short anterior splint bound on with rollers was employed. His state of health excited no fears for his perfect restoration, but

his restlessness brought about a very different result. Many of his shipmates, patients in the Hospital, were continually about his bed, and with them he would sit up eating, and amusing himself, and consequently disturbing the bandages as soon as re-adjusted. This mode of proceeding he continued, in spite of all the signs which could be made to him (for he did not understand our language) as to the impropriety of his conduct, and after ten weeks the fracture was as far from union as on the first day; the lower portion of the bone riding upon the inside of the upper for about an inch. Extension by means of bandages, with caution to retain the horizontal posture, was employed for six weeks, but without effect, as he still continued as restless as before. M. Larrey's apparatus with white of egg and tow were employed, without anticipation of benefit on my part, for a month, but no improvement ensued, although the patient was more tractable: the broken extremities of the bone lying side by side, were connected only by soft substance, and after five months we lost all hope of procuring any bony union.

The means proposed to remedy this annoying accident are, 1st, friction of the fractured extremities of the bone against each other; 2d, amputation; 3d, the introduction of a seton. Amputation, however, can hardly be considered as a mean of cure.

I employed friction for some days, but this painful operation, in consequence of the lateral position of the bony fragments, did not of course act on the extreme ends of the fractured bone, and I soon gave it up, for fear of exciting dangerous consequences.

The friction recommended by the old surgeons, has sometimes succeeded. White is said to have cured an ununited fracture of the femur in this manner. In the *Journal de Médicine de Corvisart, Roux et Boyer,* cah. iij. there is a case of ununited fracture of the leg cured in the same way. A bandage being applied around the knee, and fastened to the head of the bed, extension was made by a triple pulley, attached to a second bandage applied round the foot. "Three assistants", says the writer, "commenced the extension, by drawing the loose end of the cord: the great power employed completely elongated the limb, and I then violently rubbed the fractured extremities against each other. A bandage was then applied, over it wooden splints, and these enveloped in another roller extending from the toes to the knee, and finally pads with larger splints. No untoward accident occurred; on the fortieth day the apparatus was removed, and he left his bed on the sixty-ninth day, perfectly cured." I cannot however recommend a method, inefficacious, if the efforts to tear asunder the parts are insufficient, and dangerous, if too much violence be used.

Amputation of the fractured extremities of the bone, is an operation alike painful and difficult, and puts the patient in danger of his life: with this view of the case it ought to be rejected from surgical practice. Prudence and reason are equally opposed to that treatment which, for the purpose of remedying a mere inconvenience, would endanger the life of an individual.

White, of whom I have just spoken, was the first person who performed this operation upon a child of nine years old, who was the subject of ununited fracture of the humerus. In another case of non-consolidation of the tibia, the same surgeon "made a longitudinal incision, about four inches in length, through the integuments which covered the fracture. By the application of a trephine, he cut off the upper end of the bone; and as the lower end could not be easily sawn off, he contented himself with scraping it. In the course of the subsequent treatment, he had occasion to take off, with the cutting pincers, a small angle of the tibia, and to touch the lower part of the bone with the butter of antimony, as well as to introduce the same caustic between the extremities of the fracture, in order to destroy a substance which intervened. A trifling exfoliation followed. In twelve weeks the bone was firmly united."

One would certainly never attempt to follow so

barbarous a practice, more especially in fracture of the leg; since experience proves, that after some time perfect union will take place; of which I could cite many examples, were they not well known to hospital surgeons.

Amputation of the fractured extremities, has been resorted to in ununited fracture of the humerus. M. Larrey mentions a case of this kind under M. Viguerie the younger, the principal surgeon of the Hospital at Thoulouse, which was perfectly successful: he does not give any detail of the operation, but justly blames it, as presenting a great number of unsuccessful cases. About fifteen years since, I was present at an operation of this kind, performed by a surgeon at Borgerhout, near Antwerp; it was for an ununited fracture of the arm, which had existed for a long time. The operation was tedious and difficult; the hemorrhage, which was very troublesome, recurred after the operation; a very free suppuration was set up in the space between the ends of the bone, which were kept in their place with great difficulty; and the patient returned home without any union having been effected. In the nineteenth part of the *Journal Complementaire du Dictionnaire des Sciences Medicales*, there is a case of ununited fracture of the thigh operated on by M. Pezenat, who also cut off the fractured extremities; the patient lived, notwithstanding a very tedious suppuration, followed by

exfoliation and sinuses. The cure was not completed till twelve months had elapsed ;—however, the fracture united.

The third mode of cure proposed is the seton ; as it is less dangerous than the other plans, it has been frequently employed. M. Roux, during his visit to England, saw Mr. Bell perform this operation on a child of six years old : he gives the following account of it in his *Voyage à Londres*, 1814. It was for a fracture of the leg which had been ununited three years.

" Mr. Bell ", says he, " introduced a seton between the fragments of the tibia. For this purpose, he first made a very small incision on the outside of the false joint, then passed the seton between the bony fragments, by means of a strong but slightly curved needle, which was fixed in a handle, and its blade pierced near the point. The skin and other soft parts on the inside of the false joint were pierced with this instrument, armed with fifteen or twenty threads of silk. The result of this operation has not been published."

M. Roux also mentions two other similar operations performed by Mr. Brodie at St. George's Hospital, for false joints of the thigh. The first was in a lad, twelve years old : untoward symptoms occurred ; he remained lame, but the fracture was united. The second was a man of thirty,

who had also an ununited fracture of the thigh. The silk was removed at the end of nineteen days, on account of the excitement which supervened; a second time the seton was used; it was continued more than five months, but without effecting any union.

Mr. Samuel Cooper, in his *Dictionary of Surgery*, mentions many other unsuccessful cases. Nor are they surprising, if we recollect that the seton acts only in the course of the silk, and that suppuration once established, a fistulous ulcer is produced, which leaves the surrounding parts in statu quo.

To act upon the fractured extremities, the inflammation must be more extensive. It is recommended to introduce the seton between the fractured extremities, but it frequently happens that one portion riding over the other, they are placed side by side, rather than opposite each other. Such was the case with the individual who was the subject of this paper. I determined therefore to make use of such a plan as would excite inflammation upon a larger surface than the seton could possibly effect, and to keep up the inflammatory action by changing the point of irritation.

The following was my mode of operating:

Let it be remembered, that the left femur was

broken obliquely about the middle, and that the fractured extremities rode over each other, the lower inwards, and the upper end outwards.

The patient being placed on his back, and supported, I passed a long trocar and canula at first downwards on the inside of the upper fragment, and made it pierce the skin behind and a little to the outside; the trocar was then withdrawn, and a silver wire passed through the canula and out at the posterior opening. The canula was then withdrawn, and being replaced on the trocar, they were introduced again above and on the outside of the lower fragment, and made to pass out at the same opening behind. The trocar having been removed, the other end of the wire was passed through the canula, so that both ends were in contact behind, leaving a loop in front. I then made an incision in front, from one orifice to the other made by the trocar, and drawing the extremities of the wire through the wound, brought the loop between the fractured ends of the bone, and approximated the edges of the skin with sticking plaster.

In order to secure the tractability of the patient during the treatment, I had a wooden box constructed, sufficiently long to contain the leg and thigh, and so narrow as to serve the purpose of splints. It was lined with pads, and open at top; a hinge corresponding to the bend of the knee

allowed the leg to be slightly bent: the outside of the box had also a hinge, so that it could be dropped, and the wounds dressed without moving the limb.

The thigh was enveloped in a six-tailed bandage, the anterior wound brought together with adhesive straps, and the extremities of the wire enveloped in charpie bent outwards.

At each dressing I drew down the wire so as to depress the loop more and more into the flesh. The anterior wound, which had been made for the introduction of the loop, cicatrized in about fifteen days; the posterior wound afforded but a trifling suppuration. Six weeks after the operation, which was performed on the 12th of August 1828, the union was distinct, but the wire was not withdrawn till the 2d of October. I then divided one end of the loop near the edge of the wound, and drawing down the other, removed it completely: the loop had not, however, quite divided the parts which it encircled.

The cicatrization of the wound did not require a very long time, but in order to ensure the success of the operation, I continued the use of the apparatus for three months after the period at which it was performed. I then allowed him to get up, and walk about on crutches, having applied a pasteboard splint, first soaked in water,

to render it capable of taking the form of the limb.

The external projection of the upper extremity of the bone is now nearly absorbed ; the two ends are enveloped in a solid mass, which prevents their being felt as before the operation. The patient supports himself on the thigh without any pain, and merely complains of his knee, the motions of which are very limited.

One circumstance which would not have been expected is, that there is no apparent shortening of the fractured limb.

Antwerp, Nov. 28, 1830.

AN ACCOUNT

OF A

CONCRETE OIL

EXISTING AS A

CONSTITUENT PRINCIPLE OF HEALTHY BLOOD.

IN A

LETTER ADDRESSED TO THE SECRETARY OF THE MEDICO-CHIRURGICAL SOCIETY.

By BENJAMIN G. BABINGTON, M.D. F.R.S.

Read Feb. 23, 1830.

To the Secretary to the Medico-Chirurgical Society.

48, Finsbury Square, Feb. 12, 1830.

SIR,

I REQUEST you will do me the honour to lay before the Medico-Chirurgical Society, the following remarks on a concrete oil, which I have lately found to exist as a constituent in Blood, and a specimen of which I send for the inspection of the Society.

This oil is obtained from the serum of healthy Blood, whether that serum be milky, opalescent,

or clear, and appears to be the chief, if not the only cause, of the colour of healthy serum.

It is of a deep yellow hue, is semisolid, and melts at a temperature of 90° Fahrenheit. It is lighter than water, its specific gravity being ·918. From its solution in æther, it crystallizes by very slow evaporation, at a low temperature, in radiated tufts. It burns with a brilliant light, has a faint and peculiar odour, resembling that of a wet bladder, forms soaps with the alkalis, and in its general characters resembles other animal oils. It is uniform in colour, in general appearance, and in all its properties, from whatever kind of serum it be obtained.

The only method by which I have succeeded in separating it from clear healthy serum, is by agitation with æther, though from milky serum, in which it abounds, it may be obtained by means of alcohol, or by simple evaporation.

About one-third part of æther should be added to the serum, in a well-corked phial, which should then be reversed a few times, without violent agitation. This movement should be repeated twice or thrice, at intervals of a day or two, when after a final rest of some hours, the æther will be found to have risen to the top of the liquid, and to have acquired by impregnation with oil, a yellow colour of more or less depth, according to the pro-

portion of oil which the serum may have contained. By means of a glass syringe, the æthereal solution may be collected from the surface of the serum, and on evaporation, will yield the material in question, together with a small quantity of albumen, which the æther had taken up, and which may be easily separated by a heat sufficient to coagulate it. By a more violent agitation of the æther and the serum, an imperfect coagulation of the latter generally takes place, which in that state entangles the æther so as to prevent its separation. This effect more especially occurs, if the æther be charged with certain impurities.

Hewson, in speaking of what he calls *white serum*, says, "that although the serum of blood be naturally transparent, and a little yellowish, yet it is frequently found to have the appearance of whey, and sometimes to have white streaks swimming on its surface, like a cream, and now and then to be as white as milk, while the coagulum is as red as usual." In all these cases he states, that he has examined it microscopically, and found it to contain very small globules.

He then describes these, and after citing several cases from authors, and from the practice of his friends, of the occurrence of milky serum, he states his reason for thinking this appearance not to be owing to the patient's having been bled after a meal, or to the introduction of unconverted

chyle into the blood, but to a vast number of small globules like those of milk. "These latter being known to be oily, I conclude," says he, "that these in the human serum when white were oily likewise; and recollecting to have read somewhere of an experiment by which butter had been got from such human serum, I tried, by agitating some of it a little diluted, to separate its oil, or to churn it, but without success. I then inspissated some of it to dryness, and compared it with the natural serum of human blood, prepared in the same way, and found it less tenacious, and much more inflammable, and when this was dried, its oil oozed out so much as to make the paper in which it was kept greasy." p. 148.

This quotation I have given at large, in order that we may judge how far there was reason for doubting Mr. Hewson's conclusions, and what degree of originality we should attribute to the experiments of subsequent investigators.

John Hunter, in speaking of milky or wheyish serum, says, that "there have been many opinions formed about the nature and cause of this appearance. It has been supposed to be occasioned by chyle not yet assimilated, but it does not occur frequently enough to be attributed to this fluid. Mr. Hewson supposed it to be absorbed fat or oil, which certainly is not the case, for it is not the same in all cases."

Mr. Hunter's high authority, and positive denial of the truth of Mr. Hewson's supposition, I might almost say demonstration, that the whiteness in question was owing to oil or fat, probably prevented the institution of more decisive experiments, to set the matter beyond a doubt.

His reason for denying, that it is occasioned by chyle, as well as that which he gives for deciding that it is not absorbed fat or oil, falls to the ground; for though milkiness does not occur frequently, oil is always present; and so far from its not being the same in all cases, it is, as I have said, remarkably uniform, from whatever kind of serum procured.

In the *Edinburgh Medical and Surgical Journal* for April 1821, there is a paper by Dr. Traill, of Liverpool, headed, "Oil detected in the Serum of Blood, drawn from a person labouring under internal inflammation." The case is then stated; the serum, with its milky characters described minutely, and the following proofs adduced of its oily nature. 1*st*, That when dried, it stained paper with greasy marks, which were permanent. 2*dly*, That its dried fragments had a greasy appearance, and left an oily film of consolidated greasy matter in the capsules which had been used, which film was readily melted by a gentle increase of temperature. *Lastly*, That this minute portion of oily matter was absorbed by

means of amianthus, and produced a flame on the application of an ignited body.

In the number for October of the same year, the same author states, that he had examined another portion of similar serum, and had obtained by evaporation and the application of bibulous paper, a further portion of this oil, the quantity of which he estimated at 2.44 per cent.

In April 1823, Dr. Traill again examined the milky serum of another person, and by the same means as before, namely, evaporation and the use of bibulous paper, obtained again a result differing only as respected the proportion of oil, which in this case amounted to 4.5 per cent.

This investigator's claim to having advanced our knowledge on this subject, rests on his having rendered, more evident than Hewson had done, the existence of oil in the cases in question, by the use of amianthus, and on his having, by means of bibulous paper, inferred in two instances its proportions.

But although he separated it so completely as to demonstrate its existence beyond all doubt, yet he did not collect it in sufficient quantity to determine its specific gravity, or its melting point. His account of the oil was, that it was transparent, of a yellowish colour, and perfectly fluid

when hot, but solid, opaque, and greyish white, at the usual temperature of the air. He considered the presence of oil as connected with inflammatory disease, and suspected its presence only in milky serum.

Finally, in the number for October last, of the Journal already quoted, Dr. Christison writes as follows:—" A very common appearance of the serum of the blood in this disease, (dropsy from diseased kidney,) is a slight milkiness amounting to opalescence. This state I conceive to depend on the presence of a little oil in the blood. I have several times detected oil in opaline serum, by agitating it in a tube with æther, allowing the mixture to remain at rest for a few seconds, and withdrawing and evaporating the ætherial fluid, which rises to the top."

Dr. Christison thus, in common with Dr. Traill and Mr. Hewson, conceives the presence of oil to be necessarily connected with the opalescent appearance of serum, and I conclude, also, with a state of disease.

This gentleman's improvement consists in his employing æther as a solvent of the oil in question; but as he thus contented himself with obtaining mere evidence of the existence of unctuous matter, without collecting it in any quantity, he did not derive the advantage from this

method which it is capable of furnishing, nor add to the facts already known on the subject. Let me not, however, be understood by this remark, to impute it as a fault to the intelligent author of the paper on Dropsy from Diseased Kidney, that he did not go further. He was engaged in another highly important investigation, and his notice of oil in opalescent serum, is quite subordinate to his main subject, and occupies only a single paragraph.

I cannot lay claim to having preceded him in the employment of æther as a solvent, but when I first used it in the separation of the oil from milky serum, I was not aware of his experiments, having only within the last ten days been made acquainted with them.

This method I first had recourse to on the 26th of October last, and was pleased to find how completely it succeeded. The blood from which I procured the specimen on which I operated, was that of a diabetic patient of middle age. The serum was as white and opaque as milk, had a specific gravity of 1024, and contained exactly 3 per cent. of oil. I procured upwards of a drachm on this occasion. I next examined in succession the serum of twelve different individuals labouring under various forms of disease, and in every case I found oil. The proportion varying from two to four parts in 1000, in the different speci-

mens of serum, and that in no direct ratio with their turbidity, since one of the clearest furnished most oil. It was objected, however, by a friend, that my proof was not complete, unless I could ascertain that the blood in a healthy state contained oil. In order to meet this objection, I obtained oil from the serum of a dog, of a domestic fowl, and of a healthy man of twenty-five years of age. In this last case, the individual was bled four hours after taking his breakfast. His blood was perfectly healthy in appearance, and its serum was quite clear, and of a light yellow colour. The proportion of oil it contained, after treating it with æther thrice, when it no longer imparted any colour, was 3·12 parts in 1000.

It is to be observed that clear serum parts with this unctuous matter with much greater difficulty than serum which is rendered opalescent by a superabundance of it. On this account it is, that it is necessary, in order to separate the whole, to suffer the æther to remain on the serum for several days, and I am inclined to think, that the last portions are not given up, until the serum itself begins to decompose, when the oily part, being least disposed to change, is set at liberty, and unites with the æther *. This circumstance, added

* Since writing the above, I have found, that when healthy serum has been suffered to remain at rest for eight or ten days, its oil rises to the surface in the form of a cream-like cloudiness, and may then be dissolved as quickly as in the case of

to the fact, that dried fibrine, and perhaps also albumen, are convertible, according to Young, into adipocere, by digestion with æther and alcohol, led me at first to doubt whether the oil were not rather a product than an educt, being formed by some change effected by the æther itself. It is, I think, a sufficient refutation of this notion to observe, that the oil obtained by means of æther from milky serum, is identically the same in all its properties, including its colour, as that obtained from the same source by evaporation and bibulous paper; and again, that the oil obtained from healthy serum by æther, is the same in all its characters, as that obtained from milky serum by the same means; and finally, that when the æther has been changed once or twice, it is no longer capable of separating any more oil, though the essential properties of the serum remain unaltered.

Serum which has been clear, and from which the oil has been abstracted by æther, becomes paler than before, and turbid, so that the oil may be as essential in certain proportions to its clearness, as it is in greater proportion to its opalescence, or milkiness; but as some of the æther remains united with the serum, it is a question how far the subsequent turbidity depends on its presence.

milky serum by means of æther. This fact furnishes an additional proof of the prior existence of the oil, and establishes beyond a doubt, that the æther has no share in its formation.

With regard to colour, the same uncertainty prevails; for though the serum becomes paler by abstracting the oil, yet it does not lose its colour altogether, which may be owing to a certain portion of oil, and therefore of the colouring principle being still retained by the æther which remains united with the serum.

From the constant presence of oil in serum, and the change that takes place in the appearance of that fluid, when it is withdrawn, I am inclined to consider it a necessary constituent of the blood. At all events, it is found in sufficient quantity, in all cases, to merit the attention of the physiologist, and cannot, excepting where serum is opalescent or milky, be justly considered as the consequence of disease.

Even in milky serum there is one circumstance which favours the supposition that the oil is a necessary constituent, namely, that it exists in superabundance, apparently at the expense of the albumen; which in all the specimens I have examined, has been remarkably deficient in proportion. This fact may be inferred from its low specific gravity, as compared with that of healthy serum. Milky serum varies in specific gravity from 1019 to 1024, while the average specific gravity of healthy serum may be stated at 1029. The salts of serum I have ascertained do not raise its specific gravity beyond that of distilled water

above five parts in 1000. The excess beyond this increase, is owing to the presence of albumen. The quantity of other animal matter is too small to be worth considering in this respect, especially as they do not differ very materially from albumen in specific gravity. Hence, as I have said, the specific gravity of serum indicates pretty exactly the quantity of albumen which it contains.

From the detection of oil in the blood, as a general fact, and not an occasional event, I conceive that an important doubt is cleared up, which is stated in the following passage of Dr. Bostock's Physiology, and with which I shall conclude my present communication. " As a substance of an oily nature has been said to enter into the composition of the chyle, and as the formation and deposition of fat appear to bear a relation to the quantity of chyle which is produced, it has been conjectured that the oleaginous secretions originate in the process of chylification; *but it may be objected to this idea, that the fat cannot be detected in the blood.* Individual cases are indeed recorded, where the blood has exhibited an appearance as if something like cream was floating in it; but we are not well informed of the nature of this creamy matter; it is only a rare occurrence, and should probably be considered as depending upon some morbid, or at least some unusual state of the system."

I have the honour to be, Sir,

Your very obedient servant,

B. G. BABINGTON.

CASE

OF

PHLEGMASIA DOLENS,

CAUSED

BY INFLAMMATION

OF

THE VEINS OF THE LOWER EXTREMITY,

EXCITED BY MALIGNANT ULCERATION OF THE CERVIX UTERI.

By WILLIAM LAWRENCE, Esq. F.R.S.

SURGEON TO ST. BARTHOLOMEW'S HOSPITAL.

Read March 9th, 1830.

As the following case completely confirms the interesting and important observations respecting the nature and causes of Phlegmasia Dolens, lately communicated to the Society by Dr. Robert Lee, I sent the particulars to him. They were too late for insertion in his paper, which had been already printed; at his request, therefore, I present them to the Society in a separate form.

Anne Dawson, forty years of age, a married woman, who had borne several children, was received into St. Bartholomew's Hospital, under my care, on the 12th of November, 1829. Her com-

plexion was sallow, and the expression of the countenance altogether very unhealthy. She had pain in the loins, frequently shooting towards the hypogastric region, which was tender on pressure; costive bowels; restlessness; and sanious discharge from the vagina. She had not menstruated for several months. For the last six months she had laboured under incontinence of urine; she had perfect use of her legs, and full power over the sphincter ani. There was no tenderness in the region of the spine. Instead of the os tincæ and cervix uteri, a large irregular ulcerated excavation was found at the posterior end of the vagina. Anodynes and the occasional use of castor oil were directed, and afforded some relief.

About the 20th of November, increased uneasiness was experienced in the lower part of the abdomen, with feverish symptoms not of a severe description: the pulse was sharp and frequent, the tongue white, the skin warm, and the countenance slightly flushed. The right lower extremity swelled in its whole extent, with some increase of heat, and pain on motion, which was performed with difficulty. The colour of the limb was not altered; the swollen part of the thigh was tolerably firm, the lower part of the leg, and the foot, pitted on pressure. There was pain in the course of the femoral and iliac vessels; and the internal saphena vein could be traced at the upper part of the thigh by a hardened knotty feel. I considered the disease

to be essentially the same as the Phlegmasia Dolens, occurring in women recently delivered; there could be no doubt that the large veins of the thigh were inflamed; and the observations I had heard from Dr. Lee led me to conclude that inflammation had been excited in the veins of the uterus by the disease in its cervix, and had extended from them to the iliac and femoral venous trunks. I ordered twelve leeches to the front of the thigh, over the course of the femoral vein; that the bleeding from the orifices should be encouraged by fomentation, and the part afterwards covered with a bread poultice. A saline draught with a drachm of the sulphate of magnesia was also directed every six hours. On the next day the swelling of the thigh was less; the anasarcous state of the leg and foot remained. There was less pain, and greater freedom of motion. The feverish symptoms were lessened.

The pain returned on the 25th, when the leeches were repeated with benefit. She gradually improved from this time; the tenderness at the lower part of the abdomen being diminished, and the incontinence of urine less troublesome. The latter symptoms, however, with a discharge from the vagina, at first supposed to be menstrual, returned about the 16th of December, and were relieved by alum injections, with the internal use of dilute sulphuric acid and tincture of opium. On the 18th, violent hæmorrhage from the uterus came on

early in the morning, and was speedily fatal. A large quantity of blood had flowed before she became aware of the circumstance, and called for assistance.

Examination.

When the body was examined, on the second day after death, the fundus of the uterus was found moderately enlarged and firm: the cervix had been destroyed by that kind of phagedenic ulceration, which is usually called cancer of the uterus. The rectum and sigmoid flexure of the colon adhered firmly to the uterus; and, but for this adhesion, the ulceration would have penetrated the cavity of the abdomen. The cellular and adipose substance round the lower part of the uterus, and neighbouring portion of the vagina, were thickened and indurated, particularly on the right side. The hypogastric vein, involved in this diseased mass, was closed, in consequence of previous inflammation of its coats; and the same change had occurred in the internal iliac, the common iliac, the external iliac, the femoral and profunda veins, as well as in the internal saphena, all of which were completely impervious. The affection terminated above at the junction of the common iliac vein with that of the opposite side; the latter vessel and the inferior cava being quite natural. The saphena was closed for a length of about four or five inches, beyond which it was natural. The profunda was cut through near the femoral vein, and the latter was divided as it passes

the tendon of the triceps. The disease extended in both these vessels beyond the situations where they had been divided; but its inferior limits were not ascertained. The right spermatic vein was closed in its lower half. The coats of the affected vessels and the surrounding cellular substance were a little thickened, and their cavities were plugged by a closely adherent, and tolerably firm substance of a light brown colour. At some parts the vessels and their contents were of a dark livid hue.

The examination of this case fully confirmed the opinions which had been entertained during the patient's life, namely, that the swelling of the lower extremity arose from inflammation of the large venous trunks; and that the latter affection was owing to extension of disease from the hypogastric veins, in which it had been excited by ulceration of the uterus.

Although the inflammation of the veins had been extensive, it yielded readily to mild antiphlogistic means; and the inflamed vessels had already advanced considerably towards that natural cure, which is accompanied by obliteration of the cavity. This progress is interesting in another point of view: it shews that the disease of the vessels, although excited by a specific malignant affection, was simple or common inflammation.

18, Whitehall Place,
Feb. 7, 1830.

CASE

OF

EXTENSIVE

INFLAMMATION AND OBSTRUCTION

OF THE VEINS

OF

THE RIGHT INFERIOR EXTREMITY,

ACCOMPANIED BY A SWOLLEN STATE OF THE LIMB.

THE SUBJECT, A PHTHISICAL YOUTH.

By T H. HOLBERTON, Esq. M.R.C.S.

Read March 9th, 1830.

FEB. 26th, 1830. Robert Willis, æt. 17, No. 3, Providence Court, North Audley Street, has laboured for ten months under pulmonary consumption, in the last stage of which he at present lies, extremely emaciated; with a hurried pulse, hectic fever, copious night sweats, purulent expectoration and diarrhœa, which, together with pain in the abdomen, has been very distressing during the last eight weeks.

Three weeks ago he was seized with pain in the right ham, and immediately afterwards a hot pain-

ful swelling of the whole limb, and a considerable diminution of its muscular power, took place. At present the limb is two thirds larger than the left, hot and painful. It is colourless, excepting at the groin and inner side of the knee, where the superficial veins are enlarged and distended. The thigh pits when rather firmly pressed; is hotter and more painful along the course of the crural vessels than at its outer side; the femoral vein is clearly traced, like a hard cord, from the groin to where it perforates the tendon of the triceps; and the saphena at its upper part gives a similar sensation to the touch.

The right foot and ancle are very œdematous, and the leg also pits on pressure. There are great heat and tenderness in the hypogastric region, and especially in the right inguinal. Here a greater number of superficial veins are enlarged than on the opposite side, on which also, indeed, some are preternaturally distended. Half a dozen leeches were ordered to the right inguinal region. The wounds bled profusely for some hours, and afforded relief.

27th. The patient is easier in the lower part of the abdomen, and in the right thigh and leg. He can bear pressure rather better along the course of the femoral vessels than yesterday. The anasarca of the foot is increased. Being weak and emaciated, he was unwilling to bear a repetition of the

leeches, and, as the subsequent treatment consisted only of emollient and anodyne applications, it is unnecessary to enter into detail. He died on Friday morning, 5th inst. (March) three o'clock.

Examination,

On the afternoon of the same day. Present, Dr. Ley, of Half-Moon Street, and Dr. Robert Lee, of Golden Square, the latter of whom was kind enough to visit the patient with me on the 26th ult

The lungs were found extensively diseased. The veins from the middle of the inferior cava throughout the course of the right femoral, together with the left common iliac, were removed. Externally they were in parts knotty and hard and variously coloured, viz. whitish, dark, greyish, &c. The density of the cellular membrane around each vein corresponded with the quantity of lymph effused into the cavity of the vessel. The arteries in contact with these veins were adherent to them in the same proportion.

Internal Appearance of the Veins.—In the vena cava for two inches above its bifurcation coagulable lymph, a few drops of puriform reddish matter, and an adventitious membrane, were found; the latter adherent to the inner surface of the vein, which, on the removal of the membrane, presented roughened bloody points. The

coats were thickened where they contained the membrane, but healthy above this part.

The right common iliac vein was affected in a similar manner to the inflamed portion of the vena cava, but more intensely, being more loaded with coagulum and having its coats thicker.

The same may be observed of the right external iliac. It contained more adventitious membrane, and its coats were thicker than those of the right common iliac; and the right femoral and its branches, particularly those about the groin, were even, if possible, more distended than the right external iliac.

At the mouth of the right internal iliac, and an inch and a half down the vessel, a firm coagulum and false membrane were found, most materially obstructing, if not entirely preventing, the circulation. Yet this vein did not seem so completely blocked up as those already mentioned, neither were its coats by any means so thick as theirs, though, where the coagulum was lodged, thicker than natural. In cutting off the vessel, about half an inch remained below this point, and was of healthy appearance. The left common iliac and left external iliac were healthy. Serous fluid oozed from the incisions made in the thigh, the cellular membrane of which seemed denser than natural.

The mucous membrane of the lower fifth of the small, and of the whole of the large intestines, was ulcerated. This altered condition of the bowel increased as it descended, and the greatest portion of the lining membrane of the rectum was destroyed.

The other abdominal viscera, the bones of the spine and pelvis, and their muscles, were healthy; and no cause of the extensive mischief in the veins was discovered, unless we look to the rectum as the source of irritation.

To prove that diseased structure may give rise to inflammation of the neighbouring veins, Dr. Robert Lee, in his very valuable paper read before this Society and published in its Transactions, has related cases which have induced him to entertain that opinion, and has quoted very high authorities in support of it. "Thus," he says, "in a man who died of cancer of rectum in St. Bartholomew's Hospital, Mr. Lawrence observed the iliac veins inflamed and obstructed; and Laennec has stated, that it is not uncommon to find the veins in the neighbourhood of a cancerous breast filled with pus, either pure or mixed with blood, sometimes fluid, at other times more or less inspissated, and occasionally of the degree of consistence of an atheromatous tumour."

At the request of Dr. Robert Lee, I have en-

deavoured to draw up a statement of the facts of the case, as they appeared to me; and I feel great pleasure in submitting them to the consideration of the Society, not presuming to offer an opinion of the cause of the disease of the veins, which I fear I have but too imperfectly described.

St. George's Infirmary, Mount Street, Grosvenor Square, March 9, 1830.

APPENDIX.

Since the above paper was read to the Society, another case, very similar in its nature to that now related, has occurred to me, the leading points of which I may be allowed to state.

March 29, 1830. Isabella Weddell, æt. 35, a single woman. Ill sixteen months of tubercular phthisis. Added to the ordinary pectoral symptoms, she had tenderness over the whole of the abdomen, and acute pain at the *left inguinal region*. Catamenia absent during the last fourteen months.

On the 11th of May she was attacked by diarrhœa, attended with violent tenesmus. The motions were dark, slimy, and offensive, but unmixed with blood. She had from four to six discharges

daily from this period, till her death, which took place on the 11th of June. The character of the stools varied but little from those described ; sometimes they contained flakes of mucus, at others they were more natural.

A few days after the attack of diarrhœa, pain extended from the left inguinal region to the lower extremity of the same side.

May 25. Left foot and ancle œdematous ; no difference in size between the two thighs ; the heat of neither exceeds the natural standard, but there is acute pain in the situation of the femoral vein. From this time till her death, the œdema gradually, though slowly, extended up the whole of the limb. It felt " intolerably heavy " to the patient, but the inflammation of the vein was not marked by a regular increase of heat, as sometimes the limb would be even colder than natural. The femoral vein, during the last fortnight of her life, was felt, like a hard cord, for three inches below Poupart's ligament.

P. M. Examination.—Present Mr. Alcock.

No tumour in the abdomen or pelvis was found to obstruct by pressure the functions of the absorbents of the left lower extremity.

Uterus, vagina, and bladder healthy. Mucous

membrane of the small intestines natural; that of the large intestines destroyed at different parts. Considerable ravages had taken place at the caput coli, but the ulcers gradually became less in number as we traced the intestinal canal towards its termination, so that on the mucous surface of the lowest four inches of the rectum four ulcerations only were found.

The vena cava and iliac veins of the right side were healthy. The *left common iliac* contained lymph adherent to the sides of the vessel. The same was observed *at the union* of the *left* internal iliac with the former vein; the remainder of the vessel was healthy in appearance. The *left external iliac* appeared healthy, except just at its lower portion, where it was completely blocked up by coagulum, adherent at one part only, but there firmly, and that part was a point immediately at and below the union of the two portions of a valve. The coagulum was found to extend along the two upper thirds of the femoral vein. The *left hæmorrhoidal veins* were minutely dissected, and were in part healthy, while some contained phlebolites*. The vaginal, vesical, and

* "Calcareous concretions sometimes push the internal membrane before them, and descend with it into the cavity of the vein; the membrane becomes thin, and forms a true peduncle to the concretion. There is the closest analogy between these pedunculated concretions, and those which we sometimes find in the interior of joints. Like the latter, do the venous

uterine veins were likewise carefully traced, and found to contain similar bodies. The right hæmorrhoidal veins were healthy; the right vaginal contained phlebolites.

Infirmary, Mount Street,
Aug. 18, 1830.

concretions sometimes completely detach themselves from the coats of the vessel, and become loose in the cavity? Is this the origin of certain calcareous concretions found in the middle of clots which fill the cavity of these vessels? This is possible,—but it is also possible that these phlebolites may be produced in the blood itself.

"Phlebolites vary in size; some are scarcely so large as a millet-seed, others are equal to a small pea. We have found them in the dilated veins of the lower part of the rectum, neck of the bladder, uterus, ovaries, testicles, and in some of the subcutaneous veins of the lower extremities."—Précis d'Anatomie, Par G. Andral. Tome II., page 412.

HISTORY

OF

A CASE OF STAMMERING,

SUCCESSFULLY TREATED BY THE LONG CONTINUED USE OF CATHARTICS.

By JOHN BOSTOCK, M.D. F.R.S.

Read March 23, 1830.

IMPEDIMENTS of speech are usually regarded as originating either in a physical defect of the organs which are exercised in the production of articulate sounds, or as proceeding from some cause more of a mental nature, as habit, imitation, or the like. The modes of treatment that have been proposed, as far as we are made acquainted with them, are accordingly adapted to one or other of these supposed causes, and consist either in certain methods of managing the muscles that are concerned in speech, or in counteracting those circumstances which may be supposed to induce the habit, or the tendency to imitation. A case has fallen under my observation, which has

led me to take a different view of the subject; and as the treatment has been, upon the whole, successful, I presume that a short account of it will be acceptable to the society.

A boy of a robust form and florid aspect, of a healthy constitution, and of more than ordinary activity both of mind and body, when between two and three years old, and after having acquired considerable readiness in speaking, was suddenly affected with so great a degree of stammering as to be almost incapable of uttering a single syllable. Two eminent physicians were consulted: they confessed their inability to propose any specific plan of treatment which might afford a prospect of success, but in consequence of a somewhat plethoric state of the child, they advised that a strong purgative should be given. The effect of the medicine appeared so favourable, that it was repeated three or four times, and each time with such decided benefit, as to leave no doubt on this point in the minds either of the parents or the practitioners. The complaint, however, shortly recurred, was again attacked with the same remedy, and was again subdued. After this plan had been continued for some time, it was conceived that, in addition to the purgative system, the effect of which, although so salutary, was temporary, further advantage might be obtained by adopting a system of diet which should permanently reduce the plethoric habit, and obviate the

necessity for the continual repetition of the purgatives. This was accordingly done, and was rigidly adhered to for several years. Animal food was totally abstained from, and even vegetables were taken in as sparing a quantity as was consistent with the support of the system. The effect of this regimen was sufficiently apparent in the altered aspect of the child, who became much less plump and florid, but still retained a due share of vigour and activity, and was fully adequate to enter into all the sports and exercises suited to his age. I had frequent opportunities of witnessing the result of this plan; and I may venture to assert, that it is impossible to have stronger evidence of the beneficial operation of any medical treatment, than is presented by the case in question.

By a steady adherence to this discipline for about eight years, the complaint was kept at bay; but whenever any relaxation in the diet took place, or when the purgatives were omitted or too long delayed, symptoms of the impediment immediately appeared. At length, when about twelve years of age, the tendency seemed so far subdued, that a relaxation of the restrictions was not followed by the usual unfavourable consequences, and the boy being then at a public school, it was not so easy to maintain the former discipline. For some time no bad effects ensued, but at length the complaint recurred, and was unusually obstinate, so as to require a long and

severe course of purgatives, which, however, was finally successful.

During the last two years the tendency has occasionally manifested itself, but it has always been easily removed by a moderate use of purgatives, and by a temperate, although not a rigidly abstemious diet. The boy, who is now in his fifteenth year, may be said to be free from the complaint. No one but those who are aware of the circumstances of the case, and were on the watch to detect even a slight defect, would notice any thing peculiar in his mode of speaking. He even possesses a considerable rapidity and volubility of enunciation; and as a proof of this I may state, that I was lately present at a juvenile exhibition, when he bore a conspicuous part in a comic dialogue, in which he displayed a complete command over the organs of speech. In this respect, he may be favourably contrasted with many of those individuals who have been under the care of the masters who profess to remove these impediments. It would be unjust not to admit, that they occasionally produce very beneficial effects on those committed to their care, but I think it may be asserted, that in all these cases, there is a certain peculiarity in the mode of speaking, which although much preferable to decided stammering, indicates that the difficulty is rather evaded than obviated.

With respect to the purgatives employed in this case, it appeared to be of little importance which were used, provided the bowels were very completely evacuated. What was the most frequently employed was a full dose of calomel and jalap, succeeded by Epsom salts. Whenever the examination was made, it was found that the fæces were in a morbid state; and while the child was young, and the examination could be easily made, the necessity for continuing the medicine was judged of as much by the appearance of the fæces as by the state of the symptoms. It happened, on two or three occasions, that a degree of salivation was unintentionally excited, but it was not easy to determine whether this circumstance was productive of any advantage, as the relaxation of the bowels was contemporary and proportional.

How far we may be allowed to draw a general inference from a single case, I will not venture to decide; but I may be allowed to say, that a trial should be made of a plan of treatment which is productive of no inconvenience, which involves no expense, and does not interfere with education, or with the ordinary habits of life. It may be difficult to determine how far such a process should be recommended to adults. Much must depend upon age, constitution, temperament, &c., but I should suppose that few individuals would object to submit to a trial, although the hope of success may not be considerable.

As I propose this communication to be of a practical nature, I abstain from entering into any pathological observations on the nature and cause of the affection, further than to remark, that the complaint appears to consist essentially in a loss of power over certain voluntary muscles, and that as the muscles themselves do not seem to be affected, it ought probably to be referred to the class of nervous diseases, and may be regarded as analogous to chorea, differing from it principally in its seat, and in its being confined to one set of muscles, while chorea affects a much greater number of parts, and produces a proportionally greater disturbance of the constitution and functions.

Upper Bedford Place,
Feb. 3, 1830.

ON

THE PATHOLOGY

OF

HOOPING COUGH.

By JAMES ALDERSON, M.D.

CANDIDATE OF THE ROYAL COLLEGE OF PHYSICIANS, LONDON, PHYSICIAN TO THE HULL GENERAL INFIRMARY,

AND LATE FELLOW OF PEMBROKE COLLEGE, CAMBRIDGE.

Read April 20, 1830.

IT is somewhat strange that the pathology of Hooping Cough, a disease which affects almost every individual, and which is frequently fatal in its termination, should have received but little attention. The treatment is, in most cases, left to the care of nurses and mothers, aided by the nostrums of empyrics, and frequently by superstitious observances; whilst the serious nature of the complaint remains disregarded in consequence of the numbers who recover without medical treatment, and of the fact, that when the assistance of the physician is at length obtained, and the disease proves fatal, the death of the patient is not ascribed to Hooping Cough, but to inflammation of the

lungs, or to convulsions, the most prominent symptom of the fatal stage of the disease.

It is allowed that we possess no means more effectual for the advancement of medical science than the close investigation of those morbid changes of structure which have taken place in consequence of disease; I have, therefore, gladly availed myself of numerous opportunities of making inspections after death, and it is with much diffidence that I now lay before the Society the result of some of my examinations, in the hope that however imperfect these observations may be, they may tend to form a more correct diagnosis, and consequently lead to a more judicious and successful mode of treatment.

As the appearances on dissection, in all the cases that I have examined, have been precisely the same, I conceive we are fully justified in considering them the effects of the continued and uncontrolled action of Hooping Cough.

The construction of the lungs displays a surface of the greatest possible extent in a given volume, and hence the blood and air are enabled to act upon each other to the greatest possible advantage. Various have been the opinions of anatomists and physiologists on the *intimate* structure of these organs. Magendie* conceives that the air-

* Précis Elémentaire de Physiologie.

cells communicate with each other, but are enveloped in a thin layer of cellular tissue, which separates the neighbouring lobules: a small bronchial tube is furnished to each lobule which does not proceed further than the envelope, and then terminates abruptly as soon as it reaches the parenchyma; hence he doubts the probability of the air-cells being lined with a *mucous membrane*. Reisseisen * appears to have considered them with the most minute attention. The conclusions to which he has come are, that the extreme bronchia are subdivided into a multitude of small canals, each terminating by a globular cul-de-sac; the canals being grouped together somewhat in the manner of the ultimate subdivisions of the flower stalks of the cauliflower.

The lungs together with the heart and large vessels are contained within the cavity of the chest, whose unyielding walls present an obstacle to that examination which we have the power of making in disease of the abdominal viscera. The tender age, also, at which Hooping Cough usually occurs, (on which account we are unable to obtain accurate information of the feelings of the patient,) and the great similarity of the symptoms of most of the diseases of the chest, contribute so many difficulties in discriminating correctly between them, that I venture to hope this attempt to elucidate the nature and seat of Hoop-

* De Fabrica Pulmonum.

ing Cough will not be otherwise than favourably received by the Society.

The usual symptoms by which this disease is distinguished, are cough, coming on generally abruptly, attended sooner or later by the sonorous inspiration called hooping; the paroxysms consist of a number of short expirations quickly succeeding each other, producing almost a feeling of suffocation, followed by a full crowing inspiration *.

The cough then re-commences, and the fit continues until the patient is relieved by the expectoration or vomiting of a quantity of phlegm alone, or together with the contents of the stomach. The extremities become cold during the fit, and the paroxysms are usually most frequent and most severe during the night. If the disease be not accompanied by fever, the little patient seems quite well after the fit, and returns to his pursuits with eagerness; even if vomiting terminate the paroxysm, the appetite is immediately keen for food. In the more advanced stage of the severe form of the complaint, however, fever *is* present between the paroxysms, the hooping usually disappears, the face becomes livid, swollen, and opaque, the lips purple, the pulse very rapid, and the extremities cold, whilst the skin of the body is burning hot. The breathing becomes irregular

* Burns.

and præcordial or abdominal. The appearances detailed in the following cases which I had an opportunity of examining after death, seem to throw some light on the nature and seat of the complaint.

CASE I.

On Monday, 26th March, 1828, I visited Sarah Allison, aged two years, residing in Blewett's Buildings, Fetter Lane; she lay upon the left side; respiration difficult, irregular, and nearly the whole act taking place by the diaphragm alone; pulse very frequent; face puffy and livid; lips purple; nostrils dry; alæ of the nose in considerable action; tongue white; countenance anxious; skin of the body hot; great thirst; extremities cold; frequent paroxysms of cough, during which the child put its little fingers down its throat to get rid of the phlegm; bowels open. She had been for three weeks affected with Hooping Cough, and several children had died of the same disease in the neighbourhood. She was freely leeched and blistered, and took saline mixture with digitalis and conium, with warm bath to the lower extremities; she took no other food than barley-water.

On the 29th, difficulty of breathing increased; great restlessness; face livid; respiration very irregular and abdominal; flatulent distension of

the abdomen. In the evening, the hands became clenched and turned inwards; face puffy; jaw locked; each side of the body in turns convulsed, and she died in a few hours.

Dissection, thirty-six hours after death.—There were no adhesions of the pleura, nor any fluid in the cavity of the chest; the lungs did not collapse, they contained much air, which was with difficulty pressed out: in different parts of the lungs, but chiefly in the lower portions of all the lobes, a change of structure had taken place, which has been termed lobular hepatization; this was more evident in the middle lobe of the right lung, which was quite contracted to the size of the pancreas, and which it very much resembled in the sensation which it conveyed to the touch; the septa dividing the lobules were distinctly seen, and appeared perfectly healthy, the lobules themselves quite dense, and somewhat resembling the muscular structure of the heart; several of the smaller bronchial tubes were much dilated, and lined with thick mucus; there was no appearance of inflammation in the trachæa or in the larger bronchial tubes.

CASE II.

John Allison, aged $7\frac{1}{2}$ months, brother to the preceding; a remarkably strong and vigorous child, had been affected for a fortnight with Hoop-

ing Cough; but as he took the breast freely, and was very lively, little had been thought of his complaints. I found him, on the 11th of April, 1828, breathing with great difficulty; respirations 62 in a minute, irregular and abdominal; nostrils dry, and alæ of the nose in great action; pulse 140; tongue white and furred. Three leeches were applied to the chest, and a small blister, for four hours, between the shoulders; a grain of calomel and one-eighth of a grain of tartarized antimony, every eight hours. On the 13th he had several convulsion fits, and the abdomen became distended with flatus. The evacuations, like chopped grass and offensive, passed during the paroxysms of cough. 14th. Very sick from the antimony; had taken the breast several times, but as often vomited the milk. Bowels freely purged; motions not so green and offensive. 15th. System affected by mercury; tongue white, dry, and swollen; inner parts of the mouth and lips blistered, nostrils dry, skin of the upper parts of the body intensely hot, extremities cold, face flushed, lips purplish, breathing more laborious, catching, and abdominal. Died in the afternoon.

Dissection, forty hours after death, carefully made for me by my talented friend Dr. Hodgkin. The head was rather large, the forehead remarkably protuberant; the calvaria was not raised with greater difficulty than usually attends the operation in the infant. The quantity of serum in the ventri-

cles and under the arachnoid coat was rather larger than was natural. The substance of the brain was of the soft consistence natural to the organ at the age of the subject. The only morbid appearance observable except the before mentioned slight effusion, was an irregular venous marbling of the medullary matter. There was no trace of pleuritic inflammation on either side of the chest. About one-fourth of both lungs, towards their posterior and inferior part, was the subject of a morbid change; the structure was rendered very firm and dense; its limits were perfectly defined, the septa between the lobules constituting the boundaries. The portions in which this change had taken place were of a dull red colour, perfectly void of air, sinking instantly when put into water, and undergoing no change when thin slices were subjected to ablution in it. The individual lobules were firmer than they are often found in hepatized lungs; and the cellular membrane between them retaining its natural structure, produced a combination of looseness and density, which has not been inaptly compared to that met with in the pancreas. The remaining portions of the lungs were of a light colour, of an uniform texture, spongy and crepitant; but very little, if any, of the air pervading the cells could be expelled by the bronchial tubes. Most of the tubes were filled with a light yellow secretion, which, in the greater number, had assumed a concrete form, having very much the character of fibrine; in others it was in the

form of a thick puriform mucus: where it occurred in the concrete form, it adhered, though slightly, to the lining membrane of the tubes. This membrane was generally pale beneath the false membrane, but in some places it was a little reddened; most of the divisions of the tubes were somewhat dilated; the concrete secretion which filled them readily explained the difficulty of expressing air from the lungs. The heart was healthy: the blood in the right ventricle had formed a coagulum free from red particles: the abdominal viscera were generally healthy, and offered nothing remarkable, except that the right lobe of the liver had a deep cleft, producing an extra lobule.

CASE III.

March 2d, 1829. Louisa Cash, aged nine months, residing at 55, Baldwin's Gardens, has been three weeks affected with Hooping Cough, during which time the cough has been severe, with much hooping; she has not hooped for the last three days: face is now puffed and pale, lips livid, breathing sonorous and catching, chiefly performed by the diaphragm, is reported to have had as many as seven convulsive fits since last evening: whilst taking this report was seized with a convulsive fit: skin of the body hot, extremities not quite cold, bowels open, pulse 145. An ounce of blood was

taken from the chest by cupping, and afterwards four leeches were applied to the temples; small doses of calomel and antimony every three hours.

March 3d. Has had no fit of convulsions since 4 o'clock yesterday; takes the breast freely, though she vomits the milk very soon after. Countenance pale and death-like. Alæ of the nose in considerable action: respirations 68 in a minute, and abdominal after every four or five inspirations. She appears to hold her breath, and then let it go, with some expulsory effort, and as it were with reluctance. Pulse very frequent; cough short, but severe; does not hoop; bowels purged. A blister was applied to the back of the neck for four hours, and the medicines continued.

March 4th. Symptoms much the same: paroxysms of cough more frequent, with expectoration, whether mucous or purulent not ascertained, being swallowed, as is usual at this age. In the evening convulsions returned. Died at 9.

Dissection eighteen hours after death. No signs of pleuritic inflammation, no effusion. Both lungs had undergone the change so minutely described in the last case; the middle lobe of the right side more particularly the seat of this morbid condition, much contracted, and quite impervious throughout to air. The lower portions of the other lobes on both sides were similarly affected; the re-

maining or upper portions of the lungs were crepitant, but did not collapse on opening the chest. The bronchial tubes in many places, when cut open, appeared somewhat dilated.

CASE IV.

May 4th, 1829.

Anne Jones, aged $3\frac{1}{2}$ years, No. 9, Tash Street, Gray's Inn Lane, lies in bed with the legs drawn up; urine retained; countenance flushed; lips purple; some thirst. Pulse 148, irregular; respiration 66, abdominal; bowels open; urine scanty. Has kept her bed for eight days, during which time fever has been present between the paroxysms of cough. Had a convulsion fit this morning; six leeches were immediately applied to the throat, and a smart purge of rhubarb and calomel; in the evening a fluid drachm of ipecacuan wine was given every ten minutes, until she vomited. Warm water to the lower half of the body.

5th. Made water freely in the bath, and appeared somewhat relieved by the depletion of yesterday; tongue white anteriorly, brownish towards the root; pulse 160; respiration 68, still abdominal and irregular; lips of rather better colour; vomited a considerable quantity of mucopurulent fluid.—Small doses of calomel and anti-

mony with saline mixture and nitric ether, were ordered.

6th. Pulse 136, irregular; lies on the side, and is very drowsy; coughs, but does not expectorate; bowels open; respiration 70, abdominal and irregular; skin of the body hot, and extremities cold; in the evening she became strongly convulsed for about half an hour, previously to which she had appeared much better; the face remained puffy and purple, and she died shortly after.

Dissection, 36 hours after death.—No adhesions in the chest, nor any effusion; the inferior portion of all the lobes were in the peculiar state before described; the middle lobe of the right lung, as observed in former cases, quite contracted and changed, as in the case of Sarah Allison. There was nothing in this case like membrane, but dense muco-purulent secretion filled the more minute bronchial tubes; the heart was quite healthy, except at its apex there appeared a small flattened cyst five or six lines in diameter, which contained a limpid fluid.

Remarks.

It will be observed that in the cases which have been detailed, the same morbid change had taken

place. In many others which I have inspected, I have invariably found the same appearances, uncomplicated with any evidence of plueritic inflammation. In the lower and posterior portions of the lungs, the structure was rendered very firm and dense; the portions which were the subject of this change, exactly defined by the septa; of a dull red colour, devoid of air, sinking instantly in water, and thin slices undergoing no change by ablution. The individual lobules were more dense than in hepatized lungs, and the cellular membrane between them retaining its natural structure, conveyed to the touch the same sensation that is felt on handling the pancreas: the upper portions of the lungs were spongy and crepitant; but very little air, however, could be expelled by the bronchial tubes. Most of the smaller tubes were filled with thick secretion, in one of the cases with false membrane, in all of them the divisions of the tubes were somewhat dilated. This dilatation of the bronchial tubes is an organic lesion frequently overlooked, and to be detected only by tracing the individual tubes to their ultimate ramifications. Laennec has remarked *, that, in peripneumony of children, death usually takes place in the stage of engorgement, or after the supervention of a lobular hepatization; that is to say, a hepatization occupying only some detached points, which he explains by adverting to the

* De L'Auscultation Mediate.

greater necessity of respiration at this period of life, children requiring a greater proportion of air than adults. I apprehend, however, that the appearances detailed differ from those found in peripneumony. In Hooping Cough the lung is always dense and *contracted*, as if the air had been expelled, and from the throwing out of adhesive matter, the sides of the air-cells had been agglutinated together, while, in hepatization, the lung is less dense than in hooping cough, and is rendered more *voluminous* than in its natural state. The dilatation of the tubes and air-cells takes place in forcible expiration, in consequence of the plugging up of the bronchial tubes by false membrane, or dense muco-purulent secretion: *a foundation for future asthma.* It would appear then, that in this rapidly fatal stage of the complaint, an adhesive form of inflammation is set up in the different air-cells at the same time, mucus is secreted in less quantity than natural, a fibrinous exudation takes place, and adhesion of the parieties of the cells is the consequence; whilst the cellular membrane, separating the individual lobules, retains its natural structure: a form of disease which exactly resembles croup in a different part of the respiratory apparatus. It may be well, perhaps, if we point out the symptoms by which this state of the lung may be distinguished during life. There is fever between the paroxysms of the cough; the respiration becomes more rapid, irregular, and abdominal; that is, the action of re-

spiration is performed by the diaphragm: the alæ of the nose are called into action; the face is puffed, pallid, and opaque; and the lips purple.

This appearance of the lip is doubtless dependent on pulmonary obstruction, whether temporary or permanent, of which it is, perhaps, the most unerring symptom; it arises as well in consequence of the impervious state of the dense contracted portions, as from the dilated cells found in other parts of the lung, for Sir E. Home has shewn * that the transmission of the blood from the pulmonary artery to the pulmonary vein takes place only during expiration, or partial contraction of the air-cells. In the treatment of this stage of the complaint no time should be lost in the application of remedies; the approach to a fatal termination is rapid, and nearly the same promptitude is necessary here as in croup. Leeches are too slow in their mode of abstracting blood, to be of effectual service; I have so often been disappointed in the application of them, that I have long since discontinued their use in this case; I have, however, been much satisfied with the result of the prompt and bold extraction of blood by cupping, followed by calomel and antimony, or James's powder in small doses, repeated at short intervals, until the symptoms detailed give way to others less distressing to the little sufferer; secretion of

* Phil. Trans. of the Royal Society for 1827. Part. I.

mucus takes place; the adhesive membrane is absorbed, or thrown off and expectorated; the breathing becomes less laborious; the diaphragm taking a smaller part in the operation, and the lips assume a more natural colour. The quantity of blood to be taken is greater than, from the pulse or age of the patient, we should be led to suppose requisite or even safe.

A FURTHER INQUIRY

INTO THE

COMPARATIVE INFREQUENCY

OF

CALCULOUS DISEASES

AMONG SEA-FARING PEOPLE,

WITH

SOME OBSERVATIONS ON THEIR FREQUENCY IN SCOTLAND.

By ALEX. COPLAND HUTCHISON, F.R.S. L. and Ed.

SURGEON TO THE WESTMINSTER GENERAL DISPENSARY, AND A VICE-PRESIDENT OF THIS SOCIETY.

Read May 4, 1830.

In the year 1818, I first drew the attention of the public to the subject of the "Comparative Infrequency of Urinary Calculi among Sea-faring People," in a paper contained in the ninth volume of the Transactions of this Society. My former calculations and inferences were derived chiefly from the maritime population of the naval service, in which I had spent the greater part of my professional life, both in active service at sea, in various parts of the world, and subsequently as Surgeon to the Naval Hospital at Deal.

By official documents then obtained from the

Admiralty and sick and wounded department of the service, I showed, that during a period of sixteen years of war, including one year of an armed peace, viz. from the 1st of January, 1800, to the 1st of January, 1816, out of an annual average of 162,000 men and boys, of which the navy consisted, from between the ages of nine and ten to upwards of sixty, eight cases of stone, only, had occurred, three of which I was enabled, satisfactorily, to make out as having entered the service with the disease upon them; but the histories of the other five cases could not be traced, from the operating surgeons having died, or from the patients' names and ships whence received into hospital not being furnished; so that *their cases* even, remain doubtful. I have, however, calculated upon these five as originating in a seafaring life, and which gives one case of stone in 518,400 persons, being ·3125, or a little less than one third of a case per annum.

I have likewise shewn that during these sixteen years, 86,000 patients were admitted into the naval hospitals of Haslar, Plymouth, and Deal, from the already stated maritime population, after deducting 10,000 for gun-shot wounds, &c. which gives, only, about one case of stone in 17,200 of all classes of disease admitted: whereas, according to Dr. Marcet *, and Mr. Richard Smith of Bris-

* See an Essay on the Chemical History and Medical Treatment of Calculous Disorders, by that distinguished physician, the late Dr. Alexander Marcet, Second Edition, 1819.

tol *, the average number of stone cases admitted into the London and provincial civil hospitals, Norwich excepted, is about *one* in every 400 : the Norwich hospital being *one* in every *forty* cases of the total admissions, according to Dr. Yelloly. The Yarmouth, Peignton, and all the foreign naval hospitals were purposely kept out of my original calculations, as not any case of stone was then reported to have occurred in them during the period in question †.

* See Mr. Richard Smith's interesting statistical paper, contained in the Tenth Volume of the Medico-Chirurgical Transactions.

† I feel greatly indebted to Dr. Yelloly for the manner in which he has introduced my name into his valuable paper, in the Philosophical Transactions for 1829, and for his having called my attention to a case in the Yarmouth Naval Hospital, which occurred in 1808, and which ought to have appeared in my original paper before adverted to. I cannot account for the omission in any other way than by supposing it to have been an oversight in Mr. Burke, who was the successor to Dr. Tait as surgeon of that hospital, and my correspondent on the occasion of these inquiries.

I have, however, now traced this patient at the Navy Office. He was received into Yarmouth Hospital from L'Aimable, frigate.—His age was twenty years, and he was rated on the ship's books as *Ordinary*, which rating every naval officer very well knows, may be achieved by good conduct after being but a short time at sea; and I learn, from Dr. Yelloly's letter to me, that the stone extracted was of the mulberry species, and as large as a pullet's egg; so that the probability is that this young man entered the naval service with the disease upon him.

I must here remark, however, that Dr. Yelloly has fallen into an error in quoting from my paper in the Medico-Chirurgical Transactions, by his making my calculations of

In the present Paper, which I have the honour to lay before the Society, I shall briefly detail the result of a more extended inquiry, at every principal sea-port town in England, Scotland and Ireland, from whence answers to my queries have been received, commencing the inquiry at the period of the termination of my last, and in so doing I shall give a faithful account of every case of calculus occurring among this class of persons which may have come, directly or indirectly, under my notice, by written or oral communications; the former shall be transmitted with this to the Secretary, that the council of the Society may see the data from which I have come to the

162,000 men for a period of fifteen instead of sixteen years, and by his giving me six stone cases in place of five; which, instead of making one stone case in 400,000, or, ·4 per annum, as stated by Dr. Yelloly, (Philosophical Transactions, p. 59,) makes about *one* in 518,400, or about one third of a case per annum, as already stated in the text. The moment I mentioned this circumstance to the Doctor, he saw at once the mistake into which he had fallen, and which arose from his not remarking that my calculations had gone from the beginning of the first year to the end of the last. And with regard to his giving me one case more than I had calculated upon, this arose from his supposing, that as I had not stated the case of the young marine, who had been but a very few months at sea, so strongly as I had done the cases of the two boys, which were very peculiar and unusual, that, therefore, the marine ought not to have been included among my exemptions; but the *fact* is precisely as I reported it in my original paper, according to the documents then before me.

conclusion of the comparative infrequency of this disease among seamen.

With regard to marines * and fishermen, who it will appear have, in some instances, been the subjects of this disease, I have a few remarks to offer:—and first, with respect to the marines; I am not altogether certain, in strict fairness of argument, that they ought to be classed as sea-faring persons, in the sense, at least, in which that term is here intended to be employed; for their services are divided between the sea and the land, as is so emphatically expressed by the motto of that distinguished corps, "PER MARE ET TERRAM"; and it is well known that even during war, they are on the average nearly as much at their respective divisions (head quarters), as serving afloat, for they are regularly relieved after a certain period of sea duty; and in peace, they are even more on shore.

With respect to the latter class—fishermen,—they seldom sleep on board their vessels; and when they do, it is only in the deep-sea fishery, and where they have hardly one salt junk dinner in the time of their absence, nor are they without vegetable food;—besides it is very usual for the fishermen along the coasts of Suffolk, Norfolk, and Yorkshire, as well as on the Western coast, after

* Medico-Chirurgical Transactions, Vol. IX. pp. 449, 450.

their fishing season is over, which lasts only two or three months, to be employed in ploughing the fields, or in other agricultural pursuits. I maintain, therefore, that fishermen have, "a fortiori," much less reason to be classed among sea-faring people than the marines have.

My distinguished friend, Dr. Prout, who has attended so much to urinary diseases *, informs me that he has been consulted once, only, by the master of a coasting vessel, whom he suspected to labour under calculus of the bladder, but who had not been sounded and by a young midshipman, within the last few months, who has very lately been operated upon by Mr. Brodie †.

Dr. Prout further informs me, that in his opinion cases of stone occurring *under forty years* of age, very generally have had their commencement in early youth or in childhood; and where the disease is found to exist after this period, that it is a formation of later date. These are highly important remarks, and I have deemed it but fair

* See his valuable work, entitled "An Inquiry into the Nature and Treatment of Diabetes, Calculus, and other Affections of the Urinary Organs, &c." Second Edition. Published in 1825.

† This young gentleman, (John May, aged 18 years,) entered the naval service the end of June, 1828, and was sent on shore from H. M. S. Falcon in the following August, a period of ship service not exceeding six weeks.

they should be stated in this place, that they may have their due influence in this inquiry *.

As it is well known that persons subject to gout and certain cutaneous diseases are those who are most frequently the subjects of stone, or gravel; I may, also, mention as a remarkable fact, that during the whole of my own services, I never once met with a case of gout, or of any cutaneous disease, strictly speaking, in a seaman (psora and syphilitic eruptions excepted).—That gout occasionally occurs among officers in the navy, I am free to admit, for I have learnt that it does; but in my original paper on this subject, I have drawn a distinction between the officers and seamen, from their modes of living being so dissimilar, besides, there is in the latter class, hardly any probability of hereditary tendency to gout as in the former.

In this part of the Inquiry I have consulted my friends, Sir Gilbert Blane, the most distinguished medical authority of the age †, Drs. Magenis, Gillispie, and Burnett, Medical Commissioners of the Navy, and Physicians to the Fleet, besides numerous other medical officers in the service; and the result is, that seamen are exempt from gout and from every species of cutaneous eruption excepting those already mentioned ‡.

* In several parts of Dr. Prout's work, before quoted, much of this information is inferred.

† See Diseases of Seamen, 3d Ed. pp. 187, 188.

‡ My esteemed friend, Dr. Andrew Baird, (who was em-

Where there may be a tendency to particular diseases in certain situations, habits, and modes of living, among certain classes of persons; so may there be in others a particular exemption from them. That stone in the bladder is comparatively a rare disease among seamen, and that they possess a singular immunity from it, I am quite satisfied, as I hope to demonstrate in the sequel; but, *wherefore*, I have not presumed to say, no more than Dr. Yelloly has, as to its extraordinary prevalence in Norwich and the surrounding district; although I have, elsewhere*, thrown out some suggestions, with regard to this point, which may, eventually, lead to more correct conclusions than, from the present state of our knowledge, we are authorized to draw from them †.

ployed about forty years as a medical officer in the navy, particularly as Physician to the Fleet, and Inspector of Hospitals, &c.), has informed me that in all his practice among seamen, he has found not more than two or three cases of gout, and some few of herpetic eruption, besides those mentioned in the text.

* Medico-Chirurgical Transactions, Vol. IX.

† Dr. Yelloly, at page 66 of the Philosophical Transactions, before quoted, has very ingeniously thrown out the suggestion, which I believe, however, had long ago occurred to Dr. Prout, that as there appears to be more calculous cases in towns, in proportion to the country districts, particularly among children, whether "it would not seem to indicate the existence of a connexion between some diathesis which prevails in towns, (probably the scrophulous,) and the tendency to the secretion, or deposition of lithic acid, on which the origin of urinary calculi so much depends." Now, it is a well known fact, that seamen are peculiarly exempt from scrophulous affections; and we are all well aware that sea-air, and sea-bathing are the very

The present official returns from the medical department of the navy embrace a period of thirteen years, that is from the 1st of January, 1816, to the 1st of January, 1829, which here, at least, will be commencing the inquiry where I left it off. My correspondence with the medical officers of the civil sea port hospitals on the present occasion, will be found not always to agree with the period specified in the official returns from the sick and wounded department of the navy. They are, however, for seldom less than ten years, for which, indeed, I only asked returns; and I embrace this opportunity of offering my best thanks to Mr. Barrow and Mr. Bedford, of the Admiralty, to the Medical Commissioners of the Navy, and to the various Gentlemen herein after mentioned, for their very kind communications in reply to my letters, to whom, in most instances, I am personally unknown, and whose conduct on this occasion, clearly proves the zeal and ardour with which scientific inquiries are now encouraged in this country.

I shall now, without further comment, lay before the Society, a summary of the documents I have collected during the last few months, briefly

best remedies in these diseases. I have had several proofs in my own practice that, in decidedly scrophulous cases, where they were sent from town to enjoy sea-air and bathing, the disease was completely subdued, but on their return to London, scrophula again shewed itself as before, in an incredibly short period.

remarking upon them as I proceed, where it may be necessary.

SUMMARY.

There have been employed in the naval service, as seamen, marines, and boys, from the 1st of January, 1816, to the 1st of January, 1829, as follows * :—

In 1816	33,000
1817	19,000
1818	20,000
1819	20,000
1820	23,000
1821	22,000
1822	21,000
1823	25,000
1824	29,000
1825	29,000
1826	30,000
1827	30,000
1828	30,000
Total	331,000

Annual average for 13 years, about 25,461.—Out of the above population and period, there

* It is proper here to remark, that the number of men passing through the service, to make up deficiencies by shipwreck, desertion, death, and other casualties, has not here been taken into account, as in my original paper, *during war;* which I ascertained through Mr. Finlaison, the keeper of the records at the Admiralty, then amounted to about 30,000 annually.

have been admitted into the only two naval hospitals kept open during these years, viz. Haslar and Plymouth, 21,910 patients of all descriptions; and, extraordinary as it may appear, there has not occurred in the whole number of officers, men, and boys employed in the British navy *one* case of stone from the 1st of Jan. 1816, to the 1st of Jan. 1829.

It is true, however, that two patients with stone were, within this period, received into Haslar, and one into Plymouth Hospital, who were operated upon by the respective surgeons. The first at Haslar was a labourer employed in the King's Victualling Yard at Portsmouth, who had never been at sea, and the other (a young seaman belonging to a revenue cruiser, the Stag), who did not belong to the naval service, and for whose admission a particular order must have been given. I have ascertained at the Custom House that this man was serving on board the Stag on the 23d of May, 1829, having been discharged from the hospital cured. Mr. Farris, the commander of the Stag, says, he is 26 years of age, has been 13 years at sea, and has laboured under symptoms of stone since the early part of his youth. The third and last case was operated upon in Plymouth Hospital in March, 1828. He was a half-pay purser in the navy, 46 years of age, and had never been at sea since he obtained his first warrant as a purser, in 1799*.

* Mr. Rhind, a lieutenant in the navy, on half-pay, was cut by Mr. Hammick, as a private patient at Plymouth, in 1827. This

ABERDEEN.

The surgeons of the Royal Infirmary of this place have replied to my queries through their intelligent house surgeon, in so concise and yet so full and satisfactory a manner, that it would be injustice to Mr. Cromar to withhold a word. He says, " The cases of calculus which have occurred in the hospital during the last ten years, amount to 68. Of these there were 13 boys, 5 women, and 50 men. Of the men, 15 followed different trades, 33 were employed in agriculture, and 2 were fishermen. The ages of the boys were from 2 to 14 years; the youngest of the women was 23, and the eldest 60. One of the fishermen was 43, and the other about 50. The ages of the men varied from 45 to 71."*

officer stated to me, in conversation, that he had laboured under stone in the bladder ever since he was cured of stricture in the urethra, on the coast of America, during the war; and Mr. R., as well as Mr. Hammick, attributes the disease to the surgeon of his ship having invariably used cotton or lint in wiping the bougees for re-introduction, when he had stricture; for on making a section of the stone after its extraction, a portion of cotton was found to be its nucleus. Though it may therefore be probable that the production of a calculus in the bladder, in this case, was owing to the introduction of cotton in the manner mentioned, yet I think it but just to include this case in the calculation, as one occurring in a seaman.

* (Amsterdam). Dr. Hawkins states, that at the chief hospital of this great emporium for commerce, two cases of stone only occurred in the year 1823. See a valuable work just published, entitled, " Elements of Medical Statistics," by Dr. F. Bisset Hawkins, page 112.

BRISTOL.

Mr. Richard Smith, of Bristol, the author of a valuable statistical paper on Stone*, informs me, that in the infirmary of that city they have operated upon thirty-one cases in the last ten years. In private on two, one of which was an overseer of coal works; the latter a sailor boy of 18, who had been three voyages to the West Indies, but who experienced symptoms of stone in infancy. Besides these, Mr. Richard Smith, in his letter to me, mentions an old pilot at Pill, who has passed large pieces of gravel, but who has no stone in the bladder. The ages vary from $4\frac{1}{2}$ to 66.

Of the thirty-one hospital cases *not one* had ever been at sea: and it is mentioned in my original paper, before quoted, that an accurate record of the occupations of patients admitted into the Bristol Infirmary, has been kept ever since it was established, about 90 years ago. In this period there have been 387 operations of lithotomy performed there, and yet not one case is designated "Mariner"; which must be considered a very remarkable circumstance, when we reflect that during the greater part of that period, Bristol was the second sea-port in the empire.

DUNDEE.

Having read an interesting paper on the subject

* Medico-Chirurgical Transactions, Vol. X.

of calculus, by Mr. John Crichton, of Dundee*, I wrote to that gentleman; and his answer is, that out of about 100 operations for stone he himself had performed, and of 15 others in which he assisted Mr. Mudie, of Arbroath, three only were sea-faring persons. The first, he states, had symptoms of stone from birth; was cut at 21 years of age, and he continued at sea for twenty years afterwards in perfect health.

The second was Captain Kidd, who had been living on shore upwards of twenty years previously to the commencement of his calculous affection, and was 84 when he underwent the operation. He recovered; experienced a return of the disease two years afterwards, and again submitted to the operation, from which he also recovered †.

The third case was that of Capt. M—, R.N., who was attacked with symptoms of stone while residing at Alnwick, in Northumberland. This officer, it appears, was cut in August 1824. Mr. Crichton further states, that this patient had for twelve years before laboured under frequent at-

* See Edinburgh Medical and Surgical Journal, Vol. XXIX.

† Upon his family and friends joining to dissuade him from hazarding a second operation at his very advanced period of life, "What," said the old gentleman, stamping with his foot, "would you have me live in misery, when I can obtain ease at the expense of a few minutes' suffering?"

tacks of nephralgia, accompanied by the voiding of sand and gravel.

Mr. Bedford, at the Admiralty Office, informs me that Captain M— had not been employed at sea since April 1812; so that it appears evident the nephralgic symptoms in this patient commenced between the third and fourth month after he had ceased to serve afloat *.

EDINBURGH AND LEITH.

My friend, Sir George Ballingall, the Professor of Military Surgery in this university, says that the journals of their infirmary have been examined, and in which it appears that forty-one cases of stone had been operated upon during the last ten years; that of seventeen, whose occupations are noticed in the history of the cases, one is stated to be a Shetland fisherman, and one a sailor boy; twelve are mentioned to have been under 14 years of age; and of the remaining twelve, the occupations are not specified.

In 1821, Mr. Liston, of Edinburgh, performed his first operation for stone †. From thence to Sept.

* May there not have been a predisposition to urinary calculus in this case, and by his continued services at sea, the disease was warded off, until he fixed his residence on shore?

† See Edinburgh Medical and Surgical Journal, Vol. XXIX. p. 236, et seq.

1829, he has in all performed the operation of lithotomy thirty-four times in private practice; one only being from England, and three were under 14 years of age. These added to Sir George Ballingall's number, make seventy-five cases recorded for Edinburgh and Leith in ten years, which gives $7\frac{5}{10}$ annually for these places, as far as we know*.

GLASGOW, AND ITS SUBSIDIARY PORTS.

During the last twelve years, viz. from January 1817 to 1828†, Dr. John Macfarlane, of that city, says, that there have been admitted into their infirmary, where a correct register is kept, thirty cases of stone in the bladder, but that no seaman was of the number. In the Greenock infirmary two cases occurred; the one in a labourer, the other in a child. At Port Glasgow there is no infirmary, and but two medical practitioners in the place. The ages of the cases admitted into the Glasgow Infirmary vary from $2\frac{1}{2}$ years to 85, and *there are nine under* 14‡.

* Mr. George Bell, the distinguished surgeon in Edinburgh, informed me, September 1829, that in his practice he has operated upon several cases during the period specified. So it is to be presumed have many other surgeons, both in Edinburgh and in other parts of Scotland, in public institutions as well as in private practice.

† Nearly two years' journals of this hospital, it appears, are missing.

‡ Since the above was written, I have had sent to me the

GREENWICH HOSPITAL FOR DECAYED SEAMEN.

For nearly six years that Dr. Dobson has been surgeon to this hospital, that gentleman informs me that not one case of stone in the bladder has occurred there; but that, on dissection after death, gravel had been found in the ureters, in a few of the aged pensioners, and that he had removed portions of gravel from the urethra of three during life. This is precisely what Dr. Robertson's report was to me, after a lengthened service of twenty-seven years as physician to that institution, and which is stated in my original notice on this subject*. I am well assured also, that, for the previous six years to Dr. Dobson's appointment, no case of *calculus vesicæ* had occurred†.

GUY'S HOSPITAL, LONDON.

That highly distinguished surgeon, Sir Astley Cooper, writes me, that he kept no record of the

Glasgow Medical Journal, No. VIII. for Nov. 1829, in which will be found a very interesting paper on Lithotomy, by Dr. Marshall of that city, detailing twelve cases of operation by him between the years 1823 and 1828 inclusive, independent of Dr. Macfarlane's Infirmary cases, as also one case by Mr. James Wilson on a female. Nine of these were above fourteen years of age, and four, only, under; three were females; none were of the seafaring class; and three only have *Mr.* prefixed to the initial of the name, so that we have a right to presume that all the others were of the pauper or lower class of inhabitants.

* Medico-Chirurgical Transactions, Vol. IX.

† Since this paper was drawn up, a man who had been a

occupation of the patients cut by him in this Hospital; and that the only two patients he recollects as belonging to this class, were the naval captain and surgeon adverted to in my first paper *. Mr. Key, the present able Senior Surgeon, says, that from his private memoranda, out of forty-four cases he has there cut in seven years, one only was so far allied to a sea-faring life as to be a fisherman at Faversham in Kent.

HULL INFIRMARY, YORKSHIRE.

The only case of stone occurring unequivocally in a seaman, which my researches have enabled

marine, but discharged the service in 1815, on account of the general reduction, was admitted into Greenwich Hospital in December last, with stone in the bladder, by a special order. This man informed me, in Dr. Dobson's presence, that in 1816, when at work as a labourer in the country, he was injured in the loins while working at a winch; that for some years afterwards he suffered considerable pain in the region of the kidney, and subsequently at the neck of the bladder. This man is now undergoing the operation of lithotrity, by the Baron Heurteloup, Dr. Dobson being desirous, like a sensible man as he is, of seeing the operation performed before he attempted it himself (lithotrity being a new operation in this country): and I have great satisfaction in saying that I have seen the Baron on three several occasions operate upon this man with great adroitness.

* Dr. V. Duke, now in London, is the surgeon alluded to, and who has within these few weeks authorized me so say, that the notice of his case in my original paper was perfectly correct, for that he had laboured under symptoms of stone from infancy. The case of the captain cannot be traced.

me to make out, is that of J. Thompson, whose case is recorded by Mr. Hardy *; and this gentleman has kindly informed me by letter, that Thomson was forty years of age before any symptoms of stone occurred, and that he was sixty-six when he died with the stone in his bladder, the weight of which was 27½ ounces avoirdupois! Mr. Fielding, the Senior Surgeon to the Infirmary at Hull, informed Mr. Hardy, also, that in the last twenty-five years, the cases of stone occuring in that Institution, may be averaged at two and a half, or three annually, and that in all these, as well as in his private practice, which is very extensive, Mr. F. never knew a seaman to be the subject of this disease.

INVERNESS INFIRMARY, ETC.

Dr. Nicol of this city, the metropolis of the Highlands, has written to say, that seven cases of stone in the bladder, only, have occurred in that county, as far as he knows, or could obtain information, during the last twenty years. Five of them were operated upon by himself and the other surgeons of the place, and two in London. None were mentioned as being seamen.

LIVERPOOL INFIRMARY, ETC.

Mr. James Dawson, surgeon to this institution, has kindly informed me, that ten operations for

* See London Medical Gazette, Vol. III. p. 569.

stone have been performed there in the last thirteen years, and six in private practice, all of whom recovered. He mentions, however, that there were eight more of the former class, and ten of the latter in whom stone was ascertained to exist, who either refused to submit to the operation, or else the surgeons, for good reasons, declined it; twenty-two of the total number were natives of the place, and although an incorrect register has been furnished us, it is remarkable that none are named as being of the sea-faring class. It is proper to mention, however, that nearly four years' Hospital Journals are missing; but this deficiency, as regards numbers, has been supplied by Mr. Dawson from other sources.

Of the sixteen cases operated upon, one-half were under 14 years of age, and two of them twin boys, a remarkable circumstance in this inquiry.

NEWCASTLE UPON TYNE INFIRMARY.

Dr. Ramsay, the senior physician to this institution, has sent me an account of the stone cases admitted there, and where a very correct register is kept of the occupations of the patients; but not one is mentioned as even approaching to a sea-faring life out of twenty-seven cases in the last ten years; and what appears to be very remarkable in this report is, that the youngest subject operated upon was 20 years of age; there are three only of 21, and all the rest are 35 and upwards.

NORWICH HOSPITAL.

Dr. Yelloly, the distinguished author of the able paper on this subject, in the Philosophical Transactions for 1829 already adverted to, acquaints me that not any seaman with stone had been admitted into the Norwich Hospital, during the last eleven years that a correct register of occupations had been kept there; out of 122 admissions with this disease.

ST. THOMAS'S HOSPITAL, (LONDON.)

The cases of stone occurring in this Hospital from 1819 to 1828 inclusive, being ten years, Mr. Green, one of the able surgeons and lecturers at this Institution, informs me were seventy-seven, making $7\frac{7}{10}$ths per annum. There is not any official register kept at the Hospital, but Mr. Green states that the sister who attends all the lithotomy cases says, she *thinks* that a young man about twenty, was of the sea-faring class.

THE LONDON HOSPITAL.

This Hospital, from its proximity to the shipping in the river and docks, as well as the most crowded part for commerce of any in, or in the neighbourhood of London, has, during the last ten years, received forty-one cases of stone; being a fraction more than four per annum, and yet there does not appear among the number *one* case in a sea-faring person. A boy of fifteen, an apprentice to the

Marine Society's ship, stationary in the river, and who had never been to sea, is included in the list furnished me by the clerk of the Hospital, through the kindness of Sir William Blizard and Mr. Andrews, two of the surgeons; but this case, surely, cannot be taken into the account. A correct register of the occupations, &c. of patients admitted, is kept at this Hospital. The ages vary from $3\frac{1}{2}$ to 72 years, and of the total number, eighteen are under fourteen years of age *.

SUNDERLAND INFIRMARY AND DISPENSARY.

Dr. Brown writes that four cases of stone only have been admitted at these Institutions, but not one of them a sea-faring person. He says, however, that Mr. Gregson, a surgeon of extensive private practice for many years in Sunderland, has acquainted him that he had met with stones in the bladder on dissection after death in two aged seamen. In the one, it was distinctly made out that he had no symptoms of stone for several years after he had quitted the sea-faring life; and in the other it is stated, that he quitted the sea sixteen years before his death, but no further particulars could be obtained.

* (St. Petersburg.) Dr. Bisset Hawkins says, that at the principal Hospital (the Imperial) of this great maritime port, only thirty-two operations for stone occurred from 1803 to 1817, which appears the more remarkable, as the disease is stated to be very common in Russia.—See Elements of Medical Statistics, p. 110.

DUBLIN.

Mr. Richard Carmichael of the Richmond Hospital, and who has been long distinguished by his surgical writings, acquaints me, that there are on the average only about six cases of stone annually operated upon in Dublin. It appears, both from Dr. Egan's very interesting paper, contained in the Tenth Volume of the Transactions of the Royal Irish Academy, and from Mr. Carmichael's letter to me, dated April, 1829, that Ireland is remarkable for the infrequency of stone in the bladder, compared with other countries and localities. This exemption Mr. Carmichael attributes to the very limited use of fermented liquors in Ireland among the lower orders, and to the general use of ardent spirits. In the Richmond Hospital, which Mr. C. attends, they have on an average not more than *one* case of stone annually*.

Dr. Egan, in the paper just quoted, page 250, says, that the clergy of the Roman Catholic Church are peculiarly liable to calculous diseases, and form no small portion of the very few operated upon in Dublin; and which he attributes to the

* See Dr. Wollaston's observations on the generation of uric acid in carnivorous birds.—Philosophical Transactions for 1810, p. 229; and Practical Observations on Surgery, 2d ed. By A. Copland Hutchison, p. 324 and 334, in reference to the above observations of Dr. Wollaston.

use of a small sour wine during their residence in their seminaries abroad *.

* It appears from Dr. Egan's paper in the Transactions of the Royal Irish Academy, quoting from the Second Volume of the Memoirs of the French National Institute, Mathematical and Physical Sciences, year 7, he says, "that there was instituted about forty years ago, at Luneville, in Lorraine, an hospital for the exclusive relief of calculous and gravelly patients. In that interval, 1629 of both sexes were admitted, and operated upon;—of these 1564 were males, and only 65 females. To Citizen Saucerotte, an Associate of the Institute, we are indebted for these details," &c. I have recently learnt that this Hospital has ceased to exist. The details, however, as far as they go, are exceedingly interesting, and, as to the frequency of stone in a particular district, they far exceed even Norwich, or any other place in this country. But in France I believe it used formerly to be a common practice with patients requiring operations, to come from very distant provinces to institutions of note. It is therefore questionable, whether the patients in the above Hospital were chiefly of that particular district.

TABLE showing the total number of CASES OF STONE Operated upon in a given Period, at the under-mentioned SEA-PORT Towns, distinguishing their Age, Sex, and such as were in any manner allied to a SEA-FARING LIFE, as far as could be ascertained.

Places.	No. of Years.	No. of Cases from correct Register.	No. of Cases from incorrect Register.	Total.	Average No. of Cases annually, (nearly.)	Age.		Sex.		Sea-faring Persons.			Remarks.
						Under 14 Years.	Above 14 Years.	Males.	Females.	Sailor Boys.	Seamen.	Fisher-men. Pilot.	
ABERDEEN Infirmary	10	68	..	68	$6\frac{8}{10}$	13	55	63	5	..	..	2	
Amsterdam, (Chief Hospital)	1	2	..	2	..	..	..	..	..	..	..	..	
Bristol Infirmary	10	33	..	33	$3\frac{3}{10}$	15	18	31	2	..	..	1	
Dublin	1	..	6	6	6	..	..	..	..	..	..	..	
Dundee Infirmary, and Arbroath	37	78	37	115	$3\frac{4}{37}$	21	57	75	3	..	..	..	
Edinburgh, and Leith	10	63	12	75	$7\frac{5}{10}$	15	48	63	..	1	..	1	
Glasgow and Greenock Infirmaries	12	32	..	32	$2\frac{8}{10}$	9	23	32	..	..	..	..	
Greenwich Hospital, for decayed seamen	10	..	..	..	..	..	..	..	..	..	..	..	
Guy's Hospital, (London.)	7	..	44	44	$6\frac{2}{7}$	..	..	..	..	..	..	1	
Haslar, Naval Hospital	13	2	..	2	..	..	2	2	..	..	..	..	
Hull Infirmary, (Yorkshire.)	25	..	62	62	$2\frac{1}{2}$	..	1	1	..	..	1	..	
Liverpool Infirmary	13	..	16	16	$1\frac{3}{11}$	8	8	14	2	..	..	..	
London Hospital, (London)	10	41	..	41	$4\frac{1}{10}$	19	22	36	5	..	..	..	
Newcastle-upon-Tyne Infirmary, &c.*	10	31	..	31	$3\frac{1}{10}$	..	31	31	..	..	..	..	* This includes Sunderland.
Norfolk and Norwich Hospital	11	122	..	122	11	43	74	117	5	..	..	..	
Plymouth Naval Hospital	13	2	..	2	..	..	2	2	..	..	1†	..	† This is the Cotton Case mentioned at p. 104, in a note.
St. Petersburgh Imperial Hospital	14	32	..	32	$2\frac{4}{14}$	..	..	..	..	..	..	..	
St. Thomas's Hospital, (London.)	10	..	77	77	$7\frac{7}{10}$	..	..	..	..	..	..	..	
		506	254	760	..	143	341	467	22	1	2	5	

Upon inquiry at the Board of Trade and at the Custom House, I find that during the year 1828, there were employed as seamen and boys in the trade of Great Britain and her dependencies, exactly 155,576. In the revenue cruisers in England, Ireland and Scotland, 1,426. To this is to be added the seamen, marines and boys of the navy, amounting to an annual average of about 25,461, as before stated; making in all 182,463 seamen, marines and boys annually employed at sea, in the public and commercial services of this country, after a peace of fourteen years' duration, and yet, out of that vast population, how exceedingly small is the number of stone cases occurring among this class of persons, according to the foregoing summary *.

For obvious reasons I have studiously avoided mixing up this inquiry with any matters unconnected with its more immediate object. The statistical inquiries on the subject of urinary calculi which have been published in this country within the last fourteen years, by Drs. Marcet and Prout, by Messrs. Richard Smith, Martineau, Crichton, Liston, and lastly, by Dr. Yelloly, cannot but be highly useful to the future inquirer, and throw light upon the nature of this extraordinary disorder. I feel assured, indeed, with my lamented

* Admirals Cum——d and Doug——s, I have just been informed, have been operated upon for stone within the last twelve months; but from the best authority, the symptoms of their disease did not exist until they had been some time settled on shore.

friend, Dr. Marcet, that it is chiefly in this way that the true pathology of the disease can ever be obtained, and, consequently, the most efficacious mode of treatment.

SOME OBSERVATIONS ON THE FREQUENCY OF CALCULOUS DISEASES IN SCOTLAND.

As there does not appear to be any authentic record of the prevalence of calculous diseases in Scotland, and as it is clearly shewn from the foregoing summary as well as in what follows, that we have hitherto been very much in the dark on this interesting part of these inquiries, it may, perhaps, be permitted that I should say a few words upon it in this place.

Dr. Yelloly, quoting from Mr. Richard Smith, of Bristol, gives but eight cases of stone annually for all Scotland, and this estimate was generally considered not far from the truth. From the subjoined abstract, however, it will appear that this number is greatly under-rated by Mr. Smith; for, according to the returns here presented, the numbers will be found to be greater, even than in England, comparatively with the population of these two parts of the empire; but before I give the ab-

stract, it may be more correct to state what further information I have received since this paper was originally written, from such places in Scotland as can hardly be called sea-ports, to some of which my inquiries have subsequently been directed.

Paisley.—Mr. D. M'Kinlay, of this populous manufacturing town, and Secretary to the Medical Society there, has very kindly transmitted to me a most complete record of such cases of stone as have been operated upon in Paisley during the ten years previous to the 19th of April, 1830, and from which record we have eighteen cases in all; namely, three Infirmary patients, and fifteen private, of whom one, only, was a female; three are under 15 years of age, and the others are from 15 to 77. Their occupations are stated to be chiefly *weavers* and other *working* people—not one sailor being among the number, and what is remarkable, they were all natives of the town. Three deaths, Mr. M'Kinlay says, occurred out of the whole number, and two of these had the stones extracted by the rectum after the Sansonian method as it is called. They had both exceeded the 74th year of their age, when the operations were performed.

It must here be remarked, however, that although there be fifteen out of eighteen who are private patients, according to the Table transmitted, it does not follow that the whole number were not paupers, and operated upon at their own habitations, through the zeal and humanity of the surgeons of

Paisley, with the view, perhaps, of preventing a painful separation from their families; for it appears that the whole eighteen were working tradesmen, such as are constantly the inmates of the London Hospitals: and it is a well known and acknowledged fact, that the lower orders of Scotch people, in their own country at least, have a great aversion to receive any charity or parochial relief, in whatever shape it may be offered. I know not what this aversion arises from, if it be not pride. Be it, however, what it may, I am glad to see it, and heartily wish that the same feeling were equally prevalent in England.

The calculations made by Drs. Marcet, Prout, and Yelloly, Messrs. Richard Smith, Martineau, and others, as to the frequency of the operation of lithotomy in England, were, I believe, chiefly confined to Hospital practice, and therefore could only include the pauper population; but in my calculations as to the greater frequency of calculous diseases in Scotland than in England, it may be urged that, in a few instances, I have included private practice. It is true that I have done so, as the Table will shew; but after adding up all the private patients operated upon in the few instances where it has been mentioned, they amount only in all to twenty-six, which will be about one and a half per annum in the total number for all the places in Scotland which have been named. There will therefore remain, on an average, about twenty-two pauper cases annually for North Britain.

During this inquiry, I have been informed, with much pain and regret, that in some districts in Scotland where calculous diseases are very prevalent, that the surgeons are averse to the performance of the operation of lithotomy, lest their reputation should suffer, in the event of failure; and that, therefore, the patients are either transported to a distance to be operated upon by some celebrated lithotomist, or else they die in misery with stone in the bladder.

It grieves me exceedingly to be constrained to announce such a fact, of my professional brethren and countrymen, but I owe it to society and to myself to speak out on this occasion, as I have my information from an honest and honourable correspondent, residing in a populous town in Scotland, and in which, too, there is an infirmary! He states, however, that the surgeons of the place, being himself one, have now determined upon a reform in this particular, and that stone cases shall be operated upon without such transfer in time to come.

I sincerely trust that this notice of the subject will make its proper impression in other places as well as in Scotland ; and before I dismiss it, and take final leave of calculous diseases, the statistical part at least, I would strongly recommend every private practitioner in England, Scotland, and Ireland, as also elsewhere, to spend a month or six weeks every seven years, or oftener, in attendance

on hospital practice in the metropolis of either kingdom, including Glasgow and Aberdeen, or wherever any large hospital may be established nearest to their own residence; so as to have witnessed the practice generally, and some of the capital operations in surgery; by which means he will acquire a confidence in himself which with many, I am convinced, is all that is wanted in operative surgery; and I am also quite satisfied he will be otherwise *greatly* benefitted, and the public still more so. A little such sacrifice of time and money will be well applied, and ought, therefore, to be made for the public weal, as well as for the gratification of one's own feelings of rectitude.

OPERATIONS of LITHOTOMY Performed in SCOTLAND at the subjoined Places, in a given Period.

Places.	No. of Cases.	In No. of Years.	Or Annually about	Population.
ABERDEEN Royal Infirmary	68	10	$6\frac{8}{10}$	55,000
Dundee and Arbroath Infirmaries, &c. *	30 †	10	3 ‡	35,817
Edinburgh Royal Infirmary, &c.	75	10	$7\frac{5}{10}$	138,000
Glasgow and Greenock Royal Infirmaries 32 Additional No. by Dr. Marshall 13	45	12	$3\frac{9}{12}$	169,000
Inverness Infirmary	7	20	$\frac{1}{3}$	12,000
Paisley Royal Infirmary and private practice	18	10	$1\frac{8}{10}$	26,000
Total	243	..	$23\frac{3}{10}$	435,817

* In Messrs. Crichton and Liston's statements, seventeen only were not paupers, as they have Mr. or Captain, prefixed to their initials, and there are none so marked from Paisley.

† This is about the proportion in ten years for one hundred and fifteen cases in thirty-seven years.

‡ See Edinburgh Medical and Surgical Journal, Vol. XXIX., and a subsequent communication from the Author of that article to me.

The above statement is without calculating all the other parts of Scotland in which county infirmaries and dispensaries are established, and the number operated upon in private practice, excepting the few mentioned, throughout the whole of that country. It has been shewn, indeed, that one private practitioner alone, between January 1821 and September 1829, performed the operation of lithotomy thirty-four times, independent of his infirmary practice, which has been of very recent date, and had already been calculated upon. The above Table gives us about twenty-two pauper cases annually for Scotland, and which makes about one case of stone in 90,900 of the total population, estimating it at 2,000,000, according to the last census. But if we were to allow twenty-four pauper cases annually for all Scotland, I am quite sure that we should be nearer to the correct statement, and which would give about one case of stone in every 83,300 : the computation for all England, according to Dr. Yelloly, being one in every 108,000 of the total population.

Having thus clearly established the fact of the greater prevalence of calculous diseases in Scotland than in England, contrary to all preconceived opinions and statements on the subject, I shall conclude this article with a brief account of the mode of living among the lower orders of the Scotch, for the information of those who are less acquainted with the country than I am.

Their principal food, as Dr. Johnson says, is certainly oatmeal; cooked in various ways. It is made into cakes and pottage, or porridge, with water; and the latter, as a luxury, is sometimes made with milk. It is also made into brose, (which is oatmeal, boiling water and butter, or in place of the latter two, the fat skimmings of broth made palatable with salt,) haggis and puddings, with suet and onion. There is another mess of which the Scotch are particularly fond; it is called sowens, and is an excellent diuretic. It is made by steeping the husks of the oatmeal in water for about two days, until the mixture has become sour; the fluid is then poured off from the husks. It is put on the fire in a vessel, kept stirring, and as it boils, it thickens like a kind of paste, or farinaceous jelly. On the sea coast, or on the banks of rivers and lakes, where fish is abundant, they indulge in it, and indeed salt herrings or dried fish they have all the year round. Butchers' meat they seldom enjoy more than once a week, which is made into broth with barley and vegetables. They have cakes also made with barley meal which they call scones; these have sometimes a quantity of potatoes mixed with the meal, and potatoes are used generally in every form of cooking, with butter, with milk, and without either, roasted, plain boiled, and stewed. And finally, as gin is the bane of the lower orders in England, so is their native spirit, whiskey, the bane of the Scotch.

Scotland furnishing more calculous cases, ac-

cording to its population, than England or Ireland, may possibly be owing, in some degree, to the more sedentary occupations of the Scottish people, independently of any peculiarity in their food. Witness the numerous and extensive manufactories of cotton, linen, shawls, and worsted stuffs of all kinds, &c. all over the country; and the same reasoning may be applied to Norwich, as accounting for the great prevalence of the disease in that city.

Dutchess Street, Portland Place,
April, 1830.

PRACTICAL OBSERVATIONS

ON

THE HEALTHY AND MORBID CONDITIONS

OF

STUMPS.

By GEORGE LANGSTAFF, Esq.

Read May 4, 1830.

FROM the frequency of disease in stumps of amputated limbs, and the consequent prevention of the application of artificial aid, I am induced to offer, to this Society, the following facts and practical observations, on the healthy and morbid changes, arising from such operations, both on the upper and lower extremities; and also to describe the method I have adopted, most successfully, in making what is termed 'a good stump,' and rendering the parts capable of receiving any mechanical assistance.

I cannot effect my object better than by describing the appearances of various preparations contained in my museum, illustrative of my opinions, and by detailing the history of the cases of the individuals from whom they have been taken; and I may here remark, that as what I am about to submit, has been the result of my inquiries for nearly twenty years, I trust it will meet with the sanction and concurrence of operative surgeons.

In the first place, I shall, from various dissected stumps, describe the different changes which have taken place in the soft, and osseous parts; as well as in the arteries, veins, and nerves.

The first attempt of nature, to effect the reparation of parts divided in amputation, after the consequent inflammatory action of the minute arteries, which supply the cellular connecting media belonging to the muscles, vessels, and nerves has been subdued, is, the effusion of lymph, which becomes organized; the absorbents then remove such superfluous parts of the muscles as are likely to retard the progress of cicatrization of the integuments.

After this period the nutrient arteries of the periosteal covering of the divided bone or bones and the medullary parts, deposit lymph; a medium of cellular tissue is produced, which unites to the organized integumental surface, and these together

form a cushion, or defence, as a protection to the end of the stump.

These salutary changes effected, the absorbents begin to execute their functions by the removal of the asperities, occasioned by the division of the bone, at the time of the operation; a deposition of osseous matter takes place round the edges of the divided bone, which forms an union with the osseous matter deposited by the vessels belonging to the cancelli of the medullary, or internal part; and the absorbents, if not interrupted by nervous irritation, consequent on the disease of the stump, produce a regular rounded appearance of the extremity of the bone, only leaving apertures for the communication of the nutrient arteries, veins, and nerves of the shaft of the bone, with its coverings.

Should the surfaces of the amputated part not regularly unite by the first intention, or by the second, and there be inflammation affecting the divided nerves, then a morbid action is established, which occasions the face of the stump to ulcerate, or mortify; frequently causing a portion of the extremity of the bone to project, which occasionally becomes carious, and should be taken off; this I have had occasion to do, and I prefer Mr. Liston's forceps to any other instrument for this purpose.

Sometimes osseous deposition takes place,

round the edges of the sawn bones, and exostosis is produced; sometimes a spiculum of bone projects horizontally, generally taking the direction of the artery, vein, and nerves of the limb, which thus become implicated with the bony deposit; and, sometimes, I have found a large spiculum of bone with a very sharp point taking an oblique direction, and connected with a muscle occasioning morbid changes in its fibres, and being a source of great suffering to the patient.

In all such stumps I have invariably found the nerves greatly enlarged at their extremities, giving them a ganglionic appearance, and generally firmly adherent to the surface of the stump, and frequently in union with spicula of bone, in the manner I have just described.

I think it right to mention, that, on cutting through these bulbous extremities of the nerves, there are no signs of enlargement of their natural structure, the thickening appearing to have been occasioned wholly by the deposition of lymph, the effect of inflammation in the cellular tissue covering the neurilema.

I shall now describe, as briefly as possible, the different appearances of the surfaces of stumps, when operations have been performed above or below the knee-joint, also below or above the elbow-joint. The numbers of each are given as

they were arranged at the time they were completed, to facilitate the examination of the parts they represent.

No. 3128. Stump of the limb of a man, which had been amputated too near the tubercle of the head of the tibia, close to where the ligamentum patellæ is attached, prohibiting the use of an artificial leg.

This preparation exhibits the integuments and cicatrix of the stump, and the medium of the newly formed cellular tissue connecting them to the extremities of the divided bones and muscles; also the rounding off of the edges of the sawn bone, (as I have described before,) and the new covering to it, which has been reflected.

Some of the muscles are injected with size and vermilion, and minutely dissected, as well as the nerves and blood-vessels.

The popliteal nerve, as well as the external cutaneous, and anterior tibial, have their extremities greatly enlarged.

The patient suffered severe pain in the stump for several years.

No. 1739. The inferior portion of a thigh-bone, where amputation had been performed by the circular incision.

In this preparation, it will be seen that there is great enlargement at the extremity of the bone, but well defended by a dense covering of newly formed cellular tissue.

There is also an extensive accumulation of bone, in a horizontal direction, having its origin from the linea aspera, nearly in a line, where the thigh-bone had been sawn off. There is also a spiculum of bone with a sharp point, taking a perpendicular direction, which occasioned great irritation to the muscle with which it was in contact.

In this case, the two branches of the ischiatic nerve were united, forming one large ganglionic knob connected to the popliteal artery and vein, and to the horizontal portion of newly formed bone before described.

No. 800. Is another specimen of the end of a thigh-bone, shewing nearly the same morbid changes described in the last case.

This preparation shews, beautifully, nature's powers in the production of a cushion of cellular membrane, intervening between the bone and the integumental parts, and in rounding off the asperities of the divided bone and depositing ossific matter to cover and protect the medullary cavity.

This patient was in Cripplegate Workhouse. He informed me that he had been afflicted with scrofula in the joint, which was the cause of its being removed, about twenty years since, by Sir Astley Cooper; that the stump was an immense time in healing; and that the end of the bone projected, which was the principal cause of the want of union. The sufferings of the patient were very great, for many years; he could not bear the least pressure on the thigh, consequently was prevented wearing a wooden leg, and was often affected with increased pain by atmospherical change, which impaired his health, and rendered him incapable of attending to his business. He died of phthisis pulmonalis.

No. 801. The stump of a thigh-bone, shewing the projection of the end of the bone in a state of caries, also ulceration of the soft parts which surround it. The two branches of the ischiatic nerve are shewn, their cellular coat dissected off, exhibiting the immense enlargement of their structure in the form of a ganglion.

One of the nerves is cut open, which presents an appearance not unlike a new growth between the cellular septa, connecting the fibres of the nerves.

The extremities of these nerves are united firmly together, and with a portion of the pro-

jecting bone, close to the ulcerated extremities of the stump.

The femoral artery is injected with wax. Its course is shewn, in the preparation, passing between the tendons of the two portions of the triceps to form the popliteal, and terminating at the extremity of the stump, where it is obliterated to about the extent of an inch.

The patient was a man about seventy years of age; he died of sanguineous apoplexy, in Cripplegate Workhouse.

Previous to his death, he informed me he had suffered severe pain at the end of the stump, extending upwards, as far as the hip; in describing the seat of the pain, he traced with his finger the course of the ischiatic nerve, informing me that the end of the stump had never united completely, and that the bone projected through the ulcerated integuments. He had suffered from frequent attacks of hæmorrhage from the extremity of the stump. The limb was amputated by a surgeon in Nottingham, about thirty years ago.

No. 2835. The stump of a thigh-bone. The patient died a month after the operation.

The end of the bone projected; a fungus grew

from the medullary canal. This growth was very vascular, and bled frequently; great pain was complained of; matter formed in the cellular tissue connecting the muscles, a considerable distance from the face of the stump; the discharge was profuse, and of a very unhealthy quality; the ligatures came away, on the fourteenth day after the operation; the integuments, divided in the operation, united, except where the bone projected; but fresh collections of pus formed, and the patient died, with all the signs of irritative fever.

I examined only the stump; the gentleman who gave me the preparation, and inspected the body, said there were no signs of disease in any of the viscera.

The muscles of the thigh had nearly lost all their natural structure; they were extremely soft, and of a blackish colour; as if affected with melanosis. The femoral artery was completely obliterated at its extremity, where the ligature had been applied. There was a plug of blood and lymph in the artery, about an inch in length, which adhered partially to the internal surface of the tube.

The extremities of the ischiatic nerve, which was formed of two portions in this instance, as it occasionally is, seemed to have been placed too

near the surface of the stump. They had begun to exhibit that bulbous appearance before noticed, where they had been divided, and during the healing of the integuments had been in a state of irritation.

The periosteal covering was thickened by lymph, and greatly inflamed, from the end of the bone to a considerable distance beyond. The internal periosteum was also inflamed.

There was a deposition of ossific matter beneath the periosteum and around the extremity of the bone.

It is very probable, that the want of success, in this case, was occasioned by the inflammation of the internal part of the bone, and its periosteum, and that the exostosis was in consequence induced, as well as all the other effects, from a sufficient quantity of integuments not having been preserved when the operation was performed, and the extremities of the nerves having thereby become irritated.

No. 2773. Knee-joint of a man fifty-nine years of age, whose leg had been amputated twenty years before death, by Sir Charles Blicke, in St. Bartholomew's Hospital. The arteries were injected, and the muscles, vessels, and nerves, afterwards dissected.

The operation had not been very well performed, the tibia and fibula having been sawn off too high up to allow of proper support being given by a wooden leg. The stump did not heal well, and the cicatrix afterwards frequently ulcerated near the ends of the bones. The man said he had occasionally suffered severe pain in the stump since the operation.

On dissection, it was found that the muscles on its posterior surface, such as the heads of the gastrocnemius, and the poplitæus, also those on the outer side of the leg, viz. the upper portions of the tibialis anticus, and extensor longus digitorum pedis, from not having been for so long a time in action, had become of a whitish colour, very soft in texture, and only retained a faint resemblance of muscular fibre.

These appearances, I have no doubt, were occasioned by a sufficient quantity of integuments not having been preserved to cover the stump, which prevented its healing, and caused the diseased state of the extremities of the nerves.

On cutting open the capsule of the joint, the synovial membrane was seen greatly thickened by organized coagulable lymph, and the reflected parts of that membrane on the condyles of the femur, and that belonging to the patella, had been absorbed, and the principal part of the cartilagi-

nous coverings of the condyles, as well as that belonging to the patella, had undergone the same morbid change.

The thigh-bones and the tibiæ, in this man, had been affected with rachitis, at an early part of his life; they were gibbous, as may be seen by the lower part of the femur, which has its two sides flattened, which gives an oval figure to the cavity of the bone.

No. 1738. The healthy stump of a thigh-bone, shewing the complete reparatory process by which the bone is defended by the deposition of osseous matter, where there had not been irritating causes preventing this effect.

A portion of the femoral artery is also preserved in the preparation, exhibiting the extent of its obliteration by coagulated lymph.

No. 3646. Two portions of a thigh-bone dried, where amputation had been performed, and where the extremity of the stump had projected, in consequence of the want of integumental covering.

In this case there had been excessive inflammation of the external and internal periosteal covering, with ostitis; the latter appearance being

very apparent, not only at the edges of the sawn bone, but throughout the whole remaining part of its shaft.

The patient died from the constitutional effects of these morbid changes.

I have another specimen of the bones in a similar state in the tibia and fibula, where the result proved equally unfavourable.

No. 3647. Stump of an arm, which had been removed above the elbow-joint.

This preparation illustrates the morbid changes which had taken place, from want of union of the divided parts.

The stump is injected with size and vermilion; the ulcerated and sloughy state of its surface are well exhibited, also the inflamed condition of the periosteal covering of the projecting portion of bone, which had become affected with necrosis.

The nerves, arteries, and veins, also the obliterated portion of the brachial artery which had been secured by a ligature, are exhibited.

No. 3648. Elbow-joint, shewing the morbid

changes the extremities of the nerves had undergone, on the surface of the stump where the forearm had been amputated, and where complete union had not taken place.

To give a more clear view of the nerves and arteries, all the muscles were removed, and the parts forming the articulation were exposed, which appeared perfectly natural in structure.

In this preparation, the median, radial, and ulnar nerves are shewn, which are remarkably large ; the extremities of the two latter greatly increased by deposition and organized lymph.

Portions of the brachial, radial, ulnar, and interosseal arteries are shewn. The patient was a female, about 20 years of age. In consequence of a fall, and in endeavouring to save herself by stretching out her left arm, the articulation of the carpus was greatly injured, also the muscles and tendons, and she was immediately rendered incapable of straightening her fingers. Great effusion took place, which was succeeded by inflammation, and swelling of the whole of the hand and arm, which symptoms were not easily subdued. Every endeavour was employed to recover the power of the fingers and movement of the carpal articulation without effect. The flexor muscles and tendons were in rigid action, and the

finger ends drawn closely to the palm of the hand.

The patient continued to experience great pain, and the limb was quite useless.

She was seen by several surgeons, without receiving any benefit, and was a sufferer, nearly two years. She then obtained admission into a hospital, where every plan was employed to endeavour to restore the natural function and action of the hand, but without success. Her health became affected, and she suffered not only great misery from the painful sensations in the arm, but also from the local means employed in the recovery of the use of her fingers.

All endeavours proving fruitless, amputation was proposed and agreed to.

The stump, I understand, did not unite favourably; and she suffered distressing agony, which affected her health, so that she became extremely nervous. She was discharged from the hospital, and afterwards admitted into Cripplegate Workhouse, where she had my advice, and was strictly attended to by my son.

When I saw her, the surface of the stump presented an unfavourable appearance; the skin co-

vering the ends of the radius and ulna, was very thin, excessively vascular, and the ends of these bones seemed likely to cause its absorption. There was also a constant state of convulsive action of the muscles of the stump, accompanied with agonizing pain. Every thing that could be done to improve her health, and to relieve the pain she experienced, was fairly tried for several months without the least good effect.

Poulticing, opiate lotions, belladonna, and gentle pressure by bandage, were employed, which did not lessen her sufferings.

She was hysterical, and the paroxysms were frequent; the spasmodic affection of the muscles of the arm became more evident, and a pulsation almost aneurismal, could be seen and felt at the extremity of the stump, in the situation of the ulnar and radial arteries. It now became a serious consideration to know what could be done to prevent the exciting causes of the morbid actions. Having seen, in several cases, symptoms similar to these, caused by the extremities of the nerves becoming ganglionic, and a second operation rendered requisite for the alleviation of the patient's sufferings, I concluded this could be the only mode of treatment adopted in the present case. But I did not wish to propose amputation, without having the opinion of gentlemen capable of de-

ciding on what was to be done in such a case; she was for that purpose sent to Bartholomew's Hospital, where the opinions of two of the surgeons were obtained; the conclusion was, that they thought it would be advisable to make further attempts to improve her health, and thereby prevent the necessity of a second operation.

This advice was strictly attended to, for a considerable time, but without effect. She had frequent convulsive fits, the irritability of the muscles and the aneurismal pulsation became more violent, and her health so much more affected, that I thought it my duty to propose the removal of the arm above the elbow-joint, which she willingly agreed to. I performed it by the flap operation, and previous to securing the arteries, I drew out each nerve to the extent of half an inch from the surface of the stump with a tenaculum, and cut through them, to prevent their interrupting the progress of cicatrization of the integumental parts, which I have done in other instances with success, and I was astonished that the division did not occasion greater pain than was complained of by the patient.

She was relieved of all the painful sensations she had so long been distressed with, had no recurrence of hysteria or convulsion, her health im-

proved, a good stump was effected, and she is now able to obtain her livelihood.

No. 3644. A section of the superior extremity of the tibia, where amputation had been performed by the flap operation.

All the soft parts and periosteal covering were removed, and the bone afterwards boiled in a solution of subcarbonate of potash, to expel the fatty matter from the bone; it was then dried, and preserved in spirits of wine, and shews beautifully the cancellous structure; it likewise displays admirably how the end of the bone had been defended by the secretion of osseous matter from the minute arteries; the absorbents having afterwards removed all the asperities of the bone, thereby preventing any irritation of the newly formed cushion of cellular membrane.

No. 3645. The stump of the fore-arm of a young man, where the flap operation had been employed.

Portions of the muscles, tendons, nerves, and arteries, are shewn by dissection. In this case every thing went on favourably, after the amputation, and a perfect stump was effected.

The ends of the ulna and radius did not project, and the extremities of the nerves were

placed at such a distance from the surface of the stump that they did not become enlarged, as I have described after the unfortunate operations.

The following is a case which lately came under my care, and illustrates more remarkably the facts just stated, and renders the subject more complete.

A man fifty-one years of age, an engineer, while superintending a steam-engine, unfortunately received an injury in the left foot and leg. I was sent for, but having gone to visit a patient at Exeter, he was taken to St. Bartholomew's Hospital, and amputation was immediately performed below the knee-joint. The stump did not go on so favourably as could be desired; great swelling about the knee-joint and thigh took place, accompanied with very active inflammation, sloughing of the stump, and projection of the bones.

Great constitutional disorder was the consequence; every endeavour was made to check the threatening symptoms; erysipelatous inflammation took place at the end of the stump, extending as far up as the groin. Enlargement of the knee-joint commenced, which was suspected to depend on the formation of pus in the synovial membrane, and distinct fluctuation could be felt.

It was thought right to make an opening to let

out the fluid, which was done about six weeks after the amputation, and an immense quantity of pus, mixed with a fluid supposed to be synovial effusion, was discharged. The symptoms became less alarming; a second accumulation took place, and was again cut down to, when an immense quantity of the same kind of fluid was evacuated.

He remained in the hospital ten weeks; the stump did not heal; he was greatly enervated and emaciated. He was removed from the hospital, and, as I had for many years attended him, he wished to place himself under my care.

I visited him, on the day following the one he left the hospital, when the poor fellow was so much changed in features, that I could scarcely recognize him. The surface of the stump was in a sphacelated state, the ends of the tibia and fibula were exposed; the latter projecting considerably more than the former.

He complained of excessive pain in the knee and thigh, as high up as the groin; there was an immense enlargement of the knee-joint, and distinct fluctuation, from the presence of matter which seemed to be seated beneath the fascia of the thigh; yet the external figure greatly resembled knee-joints I have seen, where there had been great synovial effusion, and considerable

thickening of the capsular ligament, from chronic disease, or where the distension was caused by pus, the effects of active inflammation of the synovial membrane, specimens of which are in my museum *.

Upon examining the knee I could distinctly feel that the patella was not projected from the surface of the condyles as it was in the two cases I have alluded to; this induced me to imagine, the fluid was not within the capsular ligament, but only beneath the fascia of the thigh; whether this was the case or not, it was very immaterial as to the mode of treatment that was to be pursued. I therefore cut boldly down through the integuments and fascia on one side of the thigh, when, to my surprise, nearly two pints of pure pus were evacuated; showing no signs of synovia after standing. After this, I carefully examined the knee-joint, which seemed to have contained no part of the fluid that had been evacuated.

I placed a plug of lint in the opening I had made, to prevent its uniting, requesting his wife occasionally to remove it, and to endeavour with slight pressure with a sponge, to get out more matter, and then to replace the lint, and apply linseed meal poultices, mixed with opiate lotions. His health, which was greatly reduced by the ex-

* Numbered 1744, and 2029, the former exhibiting chronic, and the latter, acute inflammation.

cessive pain he had experienced, was principally to be attended to. I at first entertained little hopes of his recovery; and to amputate with such extensive destructive action going on in a constitution nearly broken down, would have been highly imprudent. His pulse was very weak, 120 in a minute; his tongue covered with a brownish fur; he had hectic flushes, and morning perspirations; his digestive organs, as might have been expected, were, to use Mr. Abernethy's phrase, greatly disordered.

He took sulphate of quinine and infusion of roses, and suitable diet was ordered. He improved in health by this treatment; but he was greatly distressed by the pain he experienced, at the end of the stump, in the joint of the knee, and along the whole course of his thigh, which disturbed his rest, and required the aid of Liquor opii sedativus to palliate his sufferings.

Fresh accumulations of matter frequently formed beneath the fascia requiring the use of the knife; sometimes the pus was excessively offensive, and gas often escaped with it.

From the patient being obliged to remain on his back in bed, the matter gravitated to both sides of the thigh, requiring frequent openings to let it out.

He was now allowed wine and porter, as he became greatly reduced by the immense quantity of matter secreted. The end of the stump began to slough again, although strict attention was paid to it by poulticing, and the application of leeches, where the integuments were inflamed.

The fibula projected considerably, and, as it appeared to be a source of great misery, I removed it with Mr. Liston's nippers, as high up as I could, taking care to remove it beyond the mortified part, that I might place it out of the reach of the surface of the stump.

After this period granulations formed, and cicatrization commenced. As there were free openings for the escape of matter under the fascia of the thigh, and as its quantity was greatly lessened, a bandage was employed, which assisted considerably in lessening the secretion.

Hope was now entertained, that things would go on favourably; but, unfortunately, the end of the stump became again painful, the joint inflamed, and required frequent applications of leeches, poultices, &c., and his health was seriously affected. Matter again formed beneath the fascia at the inferior part of the thigh, which I was obliged to cut down to, and the discharge was equally as great as that which before took place at the upper part.

The opening being very extensive, gave free outlet to the matter, and afforded the patient great relief; the discharge was very profuse, offensive, and often mixed with blood; I had frequent occasion to remove large portions of sloughy cellular membrane, and fascia. When I lifted up his thigh to examine the opening, there appeared an immense chasm, and the muscles and tendons looked like the inferior part of a thigh, where the cellular tissue had been removed by dissection.

With all these changes, by attending strictly to his health, and ordering plenty of nourishment, granulations formed; the thigh was now well supported throughout its whole length, with a belt properly regulated by buckles and straps; his health is now, April 25th, 1830, nearly as good as ever, and I believe he will soon be able to wear a wooden leg.

Observations.—Most of the specimens of the stumps I have described, were obtained from patients who died in Cripplegate Workhouse, of which institution I have held the appointment nearly twenty years, and where I have had the advantage of seeing nearly all the diseases the human frame is liable to be affected with, also extensive opportunities in operative surgery, and the permission of inspecting the bodies of those who have died there.

With these advantages, I have been led to the

study of morbid anatomy, and have formed a museum exhibiting nearly all the morbid changes of structure that we, at the present period of our pathological knowledge, are acquainted with; and which I hope, at some future period, to make public.

My object in publishing this paper is to give my reasons for recommending the flap operation in preference to the circular, in amputating the arm or leg; having witnessed the mischievous results from the latter mode, and having succeeded in every instance where I have employed the former.

In operating I make the flap by cutting obliquely through the integuments, muscles, vessels, and nerves; taking especial care to preserve a sufficient quantity of the skin to cover the end of the bone, as I believe this is all that is necessary to effect a complete union of the incised parts.

When the circular incision has been employed, I have seen the woeful effects that have ensued, from the union having been prevented, by leaving too much muscle; and it is injurious by impeding the adhesive process, the absorbents having to remove the unnecessary parts of the muscles, before this process can be established.

If, in performing the flap operation, a sufficient

quantity of skin be not preserved to cover the stump, and the ends of the nerves are likely to be included, whilst cicatrization is going on, I should have no hesitation in shortening them, by cutting off a portion of each. Not being in the habit of referring to authors who have written on pathology, my time being so much occupied with my own pursuits, I am unacquainted with the discoveries that have been made respecting the morbid changes I have been noticing. From Dr. Monro's third volume of anatomy, p. 407, and chap. 2nd., I shall copy his remarks on the organic derangement of the nerves.

" A nerve when punctured, sometimes swells considerably, and for some extent, as when the cutaneous nerve of the arm has been injured in venesection; but, in other cases, the swelling is circumscribed, and limited to a small part of a nerve; thus, a very evident tumor may be observed, connected with the extremity of the sciatic nerve, after amputation of the thigh."

In page 409, he also says, " The nerves have also been said to inflame violently; which inflammation is succeeded by suppuration."

Sommering has made mention of what he calls Corruptio Nervi. " Corruptus nervus gracilior fit, brevior, firmior, simul atque durior, semiper-

lucidus, cartilaginis in modum, coloremque cinereum induit.

" Corrupto nervo pars, quam adit, usui publico, non amplius inservit." Vid. vol. iv. of his Book, De Corporis Humani Fabrica.

Sir Astley Cooper, Bart. in his Lectures, has given two very interesting cases, denoting the symptoms and morbid changes which the nerves undergo, where there had been retraction of the skin of a stump after amputation; the cases are related in the Lancet, Vol. I. page 77. From this work I shall quote the following sentence:—

" How the nerves become longer than the bones in these cases, does not admit of easy explanation."

Having for so many years had the advantage of examining so great a number of limbs after amputation, I am led to believe, that the appearance of elongation of the nerves is a deceptive one. I do not think, from the structure of nerves, that they can be elongated.

If morbid appearances can enable one to make clear deductions, I should account for the supposed elongation in the nerves as follows:— During the first stage of nature's attempts to

unite the surfaces of the stump, the cellular tissue connecting the neurilema, forms more firm adhesion, than that supplying the muscles and tendons. If the nerves become inflamed by being placed too near the surface of the divided parts, they excite inflammation, which terminates in suppuration, and sometimes in gangrene. The nerves which supply the muscles are excited into spasmodic action, which causes them, and the integuments to be drawn upwards ; thus occasioning the bone, or bones to project ; whilst the nerves, and blood-vessels remain nearly in the place, where they were divided, having previously obtained more firm adhesion than the other parts.

I shall conclude by abstracting that portion of Mr. Lawrence's Lectures, alluding particularly to the state of the nerves after amputation. He says :—" When nerves have been divided, as in the operation of amputation, the extremity which is left swells into a kind of bulb ; a sort of oval tumour forms, or rather the end of the nerves swells into a bulb of oval shape, of perhaps about the size (in the case of a large nerve) of a nut or a filbert ; this is found to possess very considerable firmness, sometimes approaching almost to a cartilaginous structure, so that it is cut with difficulty, and makes a noise under the knife as it is divided. There are instances in which the extremities of nerves thus enlarged seem to produce

very painful symptoms after amputation. Whether it is from the extremities of the nerves being involved in the cicatrix which follows the operation, or, in certain cases, that the ends of the nerves are by the contraction of the cicatrix pressed against the sawn end of the bone, I do not know; but in many instances very painful sensations are experienced after a certain time, at the end of the stump, confined in some cases to a particular spot, and appearing to indicate that the affection depends upon the condition of the divided nerves at a certain part of the cicatrix." *

* Lancet, Vol. II. p. 564. 1829-30.

A CASE

OF

ANEURISM

OF THE

EXTERNAL ILIAC ARTERY,

IN WHICH

A LIGATURE WAS APPLIED TO THE COMMON ILIAC ARTERY.

BY PHILIP CRAMPTON, M.D., F.R.S.

SURGEON-GENERAL TO THE FORCES IN IRELAND, AND SURGEON IN ORDINARY TO THE KING.

COMMUNICATED BY

SIR ASTLEY COOPER, BART., F.R.S.

Read May 18, 1830.

TO Mr. Mott, of New York, is due the merit of having been the first to suggest and the first to effect the ligature of the Common Iliac Artery. The following case affords a second instance in which a similar operation has been performed. To the practical surgeon it will lose nothing of its interest, either because it is not the first, or because it has not been successful. In fact, paradoxical as it may appear, the progress of surgery

is more likely to be advanced by a faithful account of unsuccessful than of successful cases. In the successful cases nature performs her work in secret, and often leaves us at a loss to determine whether the success which we witness is to be attributed to the efforts of art, or to the unassisted resources of nature. In the unsuccessful cases, on the contrary, we have usually an opportunity of examining after death the effects of our operations, we see the results of those efforts which in concurrence with or in opposition to ours, nature makes for her relief, and are thus enabled to discriminate between the means which are likely to advance, and those which are likely to retard her work. I am further induced to submit this case to the consideration of the surgical profession, because in the operation I adopted a proceeding different from Mr. Mott's, and one which renders the tying of the Common Iliac Artery, or even of the Abdominal Aorta itself, (*so far as the operation itself is concerned,*) comparatively easy and safe.

CASE.

Private P. M'Gowan, 8th Foot, aged thirty, well formed, and hitherto healthy, was admitted into the General Hospital, Phœnix Park, Dublin, on the 8th of July 1828. There was a pulsating tumour extending from about three inches below the crural arch on the right side, to within about

three inches of the umbilicus. The tumour was divided by a furrow in the line of Poupart's ligament, into two portions.

The lower, or femoral portion, was scarcely compressible, and although throbbing strongly, did not communicate to the hand the peculiar "aneurismal thrill". The upper, or abdominal portion, which formed an obvious swelling in the right hypogastric region, was soft and compressible, as if filled with fluid blood, and at a particular point, about three inches above the crural arch, the aneurismal thrill, (which is caused by the jet of blood from the ruptured artery passing into the fluid blood of the aneurismal sack,) was unusually distinct. There was also a pulsating and compressible tumour, about the size of a pullet's egg, in the right ham.

The man complained of great pain in the thigh and leg, which prevented his walking, and disturbed his rest: pulse 110, full and throbbing, tongue white, but little appetite. He attributes the disease to a fall which he got in wrestling, about nine months previously. He felt but little pain at the time, but two days afterwards he observed a pulsating tumour, about the size of a walnut, at what he terms "the rim of his belly". He continued to do his duty until the 20th of May, when the tumour becoming much larger and more painful, he reported himself to the re-

gimental surgeon. During the last fortnight, the swelling has increased rapidly, and the pain is so severe, that he says he is satisfied to submit to any operation which may afford a chance of relief. From the 8th to the 17th of July he was bled five times. He was put on fever diet, purged daily, and took from twenty to thirty drops of tincture of digitalis, three times a day. The blood, which for the first four bleedings was highly buffed and cupped, presented on the 5th a natural appearance, the pain and fever had abated, and on the 18th of July he was considered to be in a favourable state for the operation.

The operation was accordingly performed at 2 o'clock P. M., on the 18th of July, in the presence of Professors Colles, Macartney, and Wilmot, Mr. Stringer, (the Surgeon to the Hospital,) Dr. Ramsay of Dundee, and several other professional gentlemen*.

* I think it may not be amiss to observe, in this place, that previously to my performing the operation on M'Gowan, I was enabled by the kindness of the gentlemen, who were conducting summer courses of anatomy, to perform preparatory dissections and operations on seven dead subjects. Two of the operations were performed at the Richmond Anatomical School, on the morning of the 18th, and on each trial, *even to the two last*, I found that I performed the operation in a manner much more satisfactory to myself than any of the preceding ones. I mention this not only as a matter worthy of the consideration of those who would limit the opportunity of the student of surgery to the dissection of two, or at the utmost

THE OPERATION.

The first incision commenced at the anterior extremity of the last false rib, proceeding directly downwards to the os ilium, it followed the line of the crista ilii, keeping a very little within its inner margin, until it terminated at the superior anterior spinous process of that bone, the incision was therefore chiefly curvilinear, the concavity looking towards the navel. The abdominal muscles were then divided to the extent of about an inch, close to the superior anterior spinous process, down to the peritoneum; into this wound, the fore finger of the left hand was introduced, and passed slowly and cautiously along the line of the crista ilii, separating the peritoneum from the fascia iliaca, the peritoneum touching the fore-part, and the fascia iliaca the back-part of the finger. A probe pointed bistoury was now passed along the finger to its extremity, and by raising the heel of the knife, while its point rested firmly on the end of the finger as on a fulcrum, the abdominal muscles were separated from their attachments to the crista ilii by a single stroke. By repeating this

four subjects, but as affording a proof, if indeed proof be wanting, that operative surgery cannot be usefully cultivated without almost unlimited means of practising dissection, and that, as it has been well expressed, "We must choose between mangling the living or the dead".

manœuvre, the wound was prolonged until sufficient room was obtained to pass down the hand between the peritoneum and the fascia iliaca. Detaching the very slight connections which these parts have with each other, I was able to raise up the peritoneal sack with its contained intestines on the palm of my hand, from the psoas magnus and iliacus internus muscles, and thus obtain a distinct view of all the important parts beneath; and assuredly a more striking view has seldom been presented to the eye of the surgeon; the parts were unobscured by a single drop of blood; there lay the great Iliac Artery, nearly as large as my finger, beating awfully at the rate of 120 in a minute, its yellowish white coat contrasting strongly with the dark blue of the Iliac Vein which lay beside it, and seemed nearly double its size; the ureter in its course to the bladder lay like a white tape across the artery, but in the process of separating the peritoneum, it was raised from it with that membrane to which it remained attached. The fulness of the Iliac Vein seemed to vary from time to time, now appearing to rise above the level of the artery, and now to subside below it. Nothing could be more easy than to pass a ligature round an artery so situated. The fore finger of the left hand was passed under the artery, which with a little management was easily separated from the vein; and on the finger, (which served as a guide,) a common eyed probe furnished

with a ligature of moistened catgut was passed under the vessel. A surgeon's knot was made in the ligature, and the noose gradually closed, until Mr. Colles, who held his hand pressed upon the tumour, announced that "all pulsation had ceased!" A second knot was then made, and one end of the ligature cut off short. On examining the vessel after it had been tied, it was found to be full, and throbbing above the ligature, but empty and motionless below it. The external wound was united by three or four points of suture, and supported by long straps of adhesive plaster. The operation was completed in twenty-two minutes; the patient, who was a firm minded man, made no complaint during the operation, not even when the ligature was closed upon the artery. The tumour, immediately after the operation, was diminished nearly one-third, the diminution being confined to the abdominal portion; ten minutes after the operation, the pulse was 96; at 7 p. m. Mr. Stringer, finding the pulse full and bounding, took 20 ounces of blood from the arm; at 10 p. m. I found him tranquil, no pain, pulse 88, the limb, with the exception of the toes, warm: Saphena Vein full; additional flannel was wrapped round the foot.

Saturday, 19th. Had some sleep, no sense of throbbing, pulse 88, toes warm, but not so warm as those of the left foot; no pain of the abdomen, even on pressure; bowels not open; or-

dered an ounce of castor oil, and an enema if necessary.

Sunday, 20th. An uneasy night from pain and rumbling in the bowels; no stool, temperature of both limbs equal, five grains of calomel, three hours afterwards an ounce of castor oil, and two drachms of oil of turpentine, opened the bowels at four o'clock, and removed all uneasiness from the abdomen. It was now, just fifty hours after the operation, first observed by Mr. Corr, (one of the House pupils,) that there was an obscure pulsation in the tumour.

Monday, 21st. There is decidedly a pulsation in the whole tumour, obvious both to the touch and to the eye, but there is no "thrill", as if the contents of the sack were fluid. No pulsation in the Femoral Artery below the tumour, and none whatever in the aneurism at the ham, which is reduced to half its original bulk. Pulse 88, skin cool; no pain; temperature, as ascertained by repeated trials with the thermometer, at the groin 98°, at the hams 97°, at the ancles 94°, at the ball of the *left* great toe 87°, at the right 88°.

Tuesday, 22d. Pulsation still evident, accompanied (in the opinion of some of the observers) with an obscure thrill; tumour not increased; no pain; pulse 86; no pulsation in the ham.

23d. No change.

24th. Little or no change, unless that the pulsation in the abdominal portion of the tumour is perhaps more distinct. Ordered to be bled (in the erect position) ad deliquium; tincture of digitalis, 20 drops every third hour; fever diet.

The object of this treatment was to diminish the force of the circulation through the tumour, in the hope that its contents might coagulate. It was plain, that from whatever source the blood was derived, it was flowing into the aneurismal sack, but with diminished force.

25th. (7th day.) Countenance pale, pulsation *more* distinct, the thrill quite perceptible, no pulsation in the Femoral Artery below the crural arch, blood drawn yesterday buffed, and cupped; 12 oz. of blood taken from the arm; digitalis increased to 30 drops, three times a day; diet as before.

26th. (8th day.) The ligature came away last night, but was lost in the bed; pulse as yesterday: on turning in the bed he suddenly felt a severe pain in the thigh and knee, "as if" (to use his own expression) "the knee was tearing off of him"; said "the fore part of the thigh was all numb." He cried out from pain: in ten minutes it subsided.

It now became a subject of great interest, to determine the cause of the return of the pulsation, after it had ceased for fifty hours. Has the blood returned by the free anastomosis between the Internal Iliacs? or has the catgut ligature become macerated, and given way? The pulsation is stronger than could be expected, if the tumour were supplied only by the collateral source of anastomosis; the prevalent opinion therefore was, that the ligature had given way.

27th. Less pain in the knee and thigh; in other respects as yesterday.

28th. As yesterday, but complains less; asks for nourishment: the wound is quite healed, with the exception of about an inch, in the middle of this line, the hole through which the ligature escaped is apparent. Pulsation in the tumour nearly as strong as before the operation; yet the whole bulk of the tumour is reduced by at least a third.

At 6, p. m., while he was sitting up in his bed, taking some gruel, the blood suddenly gushed from the wound, and deluged the bed. He fell backwards, and expired in less than a minute. The body was examined at one o'clock on the following day, in the presence of Messrs. Colles, Wilmot, Cusack, Stringer, Porter, and several other professional gentlemen.

Dissection.

The intestines being removed, the peritoneum raised, and the great abdominal vessels laid bare, the Common Iliac Artery, at about three-fourths of an inch from the bifurcation of the Aorta, was lost in an oblong tumour, about three-fourths of an inch in diameter, and one and a half in length; the tumour terminated upon, but did not communicate with, the aneurismal sack. On cutting into the tumour, about half an ounce of greenish pus flowed from the wound, and discovered the artery, which appeared somewhat contracted at one part, and its coats deeply indented, but not cut through, marking the place where the ligature had been applied. On blowing into the Iliac Artery from above, bubbles of air escaped freely from the external wound from whence the blood had issued; water injected by a syringe escaped by the same passage; clearly establishing the important fact, that the ligature, which was of cat-gut, had been dissolved by the heat and moisture of the wound, and thrown off, before the obstruction of the artery, or the coagulation of the blood in the aneurismal sack, had been completed. It further appeared that the dissolution of the ligature had caused a small abscess to form in the place which it occupied. On slitting up the artery, the internal and middle coats were found to be completely divided in the

whole circumference of the vessel, and small portions of lymph adhered to its internal surface. The poplitæal aneurism was far advanced towards a cure; the contents of the sack were quite solid, and the tumour was reduced to about the size of a walnut: the artery, for six inches above the sack, was filled with a firm coagulum *.

The most important inferences to be drawn from this case are,

1st. That the operation of tying the Common Iliac Artery, is not only a feasible, but (when performed in the manner described in this paper) is an exceedingly easy operation. The difficulties which Mr. Mott encountered, and which prolonged the operation "to nearly an hour" †, are clearly referable to the circumstance of his incision having been made *too low*. This in the first place brought him in contact with the aneurismal tumour, from which he was obliged, with great labour and considerable risk, to detach the peri-

* The parts are depositedi n the museum at the Park Street School.

† "The operation lasted rather less than an hour." Vide Dr. V. Mott, New York. "Successful Ligature of the common Iliac Artery."

toneum *; then he had the whole mass of the tumour between him and the artery which he was to tie: and lastly, he had the intestines pressing down upon him, and producing such a complication of difficulties, as I believe few men but himself could have encountered with success. All these difficulties however, might, I think, have been avoided, by getting at the artery from behind and above the tumour; in a word, by an incision, which should begin where Mr. Mott's terminated.

2d. The question has often been proposed, "whether, under any possible circumstances, a surgeon would be justifiable in passing a ligature round the Abdominal Aorta?" Without venturing to give a decided opinion upon this subject, it may not be amiss to observe, that in several instances, aneurisms of the Abdominal Aorta have undergone a spontaneous cure, in consequence of the obliteration of the artery above and below the tumour.

I have given, in the 2d volume of Dublin Hospital Reports, the history of a case of this

* "With the tumour beating furiously underneath, I now attempted to raise the peritoneum from it, which we found difficult and dangerous, as it was adherent to it in every direction." See "Successful Ligature," &c., by V. Mott, New York.

kind; and the preparation illustrative of it, is now in the museum of Guy's Hospital, where it was deposited by Sir A. Cooper, to whom I transmitted it in the year 1819.

If such an operation should be determined upon, I have no doubt, that by a proceeding similar to that which I have described in this paper, a ligature could with great ease be passed round the abdominal aorta, without interfering with the cavity of the abdomen.

ON

THE GLANDERS

IN THE

HUMAN SUBJECT.

By JOHN ELLIOTSON, M.D. Cantab. F.R.S.

FELLOW OF THE ROYAL COLLEGE OF PHYSICIANS, PHYSICIAN TO, AND LECTURER ON THE PRACTICE OF MEDICINE IN, ST. THOMAS'S HOSPITAL, VICE-PRESIDENT OF THE SOCIETY, ETC.

Read June 1, 1830.

THOMAS MASKALL, aged seventeen, apprentice to his uncle, a tailor at Woolwich, was admitted into George's Ward, St. Thomas's Hospital, under the care of Dr. Roots, on Thursday, March 19, 1829. The upper half of the face, including the eyelids and the nose with the portion of the cheek on each side, especially on the right, was greatly tumefied, so that the eyes were closed. The eyelids and swollen portions of the cheeks were red and hot, dry and shining, but the nose was dark-coloured, and on its right half black,

cold, and senseless. From around the gangrened portion of the nose and some other points a little pus was oozing, as well as a thin dark-coloured fluid, and, *from the nostrils a thick discharge of a deep yellow colour, here and there a little bloody, was taking place,* exceedingly copious from the *right* nostril. Several *hard* phlyzacious pustules existed on and immediately around the nose, still principally on the right side, and in various parts of the trunk and extremities. Tumefactions were observed in both fore-arms and in the back of the right hand. Some of these were hard, others softening into suppuration. The temperature was high; the pulse 136, and sharp; the tongue white and rather dry. The respiratory murmur was indistinct at the right lower part of the chest, and the respiration quick and difficult. The gums were slightly turgid.

It was stated that twelve days previously, (Saturday, March 7,) he had been attacked by pain in the right hypochondrium, extending up the chest, dyspnœa, and rigors: that he took ten grains of pilula hydrargyri, and the next day felt quite well. The pain and dyspnœa, however, returned on the day following, but subsided by the end of the week under the use of leeches and purgatives. On the Sunday, five days before his admission, a pimple was said to have appeared upon the right side of his nose; while this increased and suppurated, the surrounding parts

swelled and grew red, and the state of things became such as I have already described.

About five weeks before his admission, a gonorrhœa had begun, for which he believed that he took mercury, by the direction of some irregular practitioner, and the condition of his gums rendered this extremely probable.

Fourteen ounces of blood were taken from the arm, and became both buffed and cupped. Some of the tumefactions were cut into, and large quantities of pus discharged. Lint soaked in a solution of the chloride of soda and covered with a poultice of stale beer grounds was applied over the nose fresh every hour, and a common poultice to the abscesses which had been opened. An ounce of castor oil was given, and the diet restricted to slops, milk, and arrow-root.

Late in the evening, two greenish and very offensive stools were passed involuntarily, and a little delirium was observed. Tumefactions had begun upon both legs, one upon the left hand, and one upon the right elbow. The next morning more tumefactions were seen upon the extremities, red as all the others had been: but the others had now acquired a purple tint, and the wounds looked dark. The forehead was swollen and red, and more pustules had formed upon the face. There was constant agitation, frequent de-

lirium, profuse diarrhœa, and there had been no sleep. Mistura cretæ composita was prescribed, sixteen leeches applied to the temples, and strong beef-tea added to the diet.

In the evening the diarrhœa was checked; but the upper lip had grown very dark, sordes encrusted the teeth, the surface, still hot, was covered by a profuse sweat, and many new hard pustules were seen upon the trunk and extremities. The pulse had become soft, and was small and rapid. Twenty-five minims of tinctura opii were given in the first dose of the mistura cretæ composita, and one grain of the sulphas quininæ every four hours prescribed. The oleum terebinthinæ was substituted for the solution of the chloride of soda.

He was calm after taking the opium, but about four o'clock in the morning was observed to breathe with more difficulty, to be unable to swallow, and to be constantly delirious; and from that time he sank gradually, and expired at six.

I was not present at the inspection, but understand that there were proofs of a violent pleuro-peripneumonia in the lower part of the right side, and that two ounces of healthy pus were found between the adherent lung and diaphragm. A dark red patch existed in the stomach, and several at irregular distances throughout the intestines. The

mucous membrane of the stomach was very lacerable at that spot. The other viscera, and all the contents of the head as well as the veins of the extremities, were reported healthy: but the mucous membrane of the nostrils was not examined. The abscess which had been opened in the back of the right hand communicated with the joint of the metacarpal bone of the middle finger, but those on the arm did not communicate with the elbow.

The case was perfectly new to us. It excited great interest, but its nature was a mystery. Dr. Roots wrote simply, "Gangræna nasi; suppuratio palpebrarum," on the ticket at the foot of the patient's bed. The reporter to the Lancet headed his account "Gangrene of the Nose, with extensive suppuration of the cellular membrane;" adding, that the case was considered of rare occurrence, and from the time of its admission excited a good deal of interest: while the reporter to the Medical Gazette headed his account, "Spontaneous Gangrene of the Nose,—abscesses in various parts," subjoining the query, whether these, together with the abscesses in the lungs, and the inflammation of the mucous coat of the intestines, "were the effects of mercury?" This was asked in consequence, I think, of some one having stated, at the patient's admission, that it was a variety of irritation or erythema, which he had frequently

witnessed in the cheeks of children after the employment of that mineral *.

It is singular that the profuse discharge which took place from the nostrils, and from one especially, is omitted in these reports, and, indeed, in every account that I have read. The appearances suggested to me the idea that some deleterious matter had been introduced into the system. I enquired if he had probably been in the way of catching such a complaint, if he knew of any one similarly affected, and if he had taken any other food than what was habitual to him and good or than what was used by the rest of the family. But all these questions were answered in the negative, and, therefore, when asked for my opinion by the pupils, I declared myself perfectly at a loss.

On Friday, the 26th of the following June, it being my week to admit patients, I was surprised to find another young man, named Thomas Dixon, and twenty-one years of age, lying in bed in

* I believe that the gangrene of the cheek, seen occasionally in children, and sometimes attended by erythema and swelling, is ascribed unjustly to any mercurial medicines that may have been given. It is quite as frequent after typhus, variola, rubeola, and scarlatina, &c. when no mercury has been exhibited. See an instructive paper upon this affection, under the title of *Cancrum oris*, by Dr. Cuming, in the Fourth Volume of the Dublin Hospital Reports, in which references to preceding authors will be found. The symptoms of the disease are totally different from those of the glanders.

William's ward, with the same symptoms as the former.

The nose and surrounding parts were exceedingly swollen, so that the left eye was closed completely, and the right nearly. The tumefied parts were hot, and of a bright red, with the exception of an inch of the left half of the nose, which was of a mulberry colour: *a profusion of deep-yellow tenacious mucus, with a few streaks of blood, exuded from each nostril*, but particularly from the *left*. Several *hard* phlyzacious pustules existed on the nose and adjacent parts, on the arms, thighs and legs, and each was surrounded in the latter situations by a blush of red. A patch of the same colour was observed on the left elbow. The temperature of the surface of the abdomen was 107°. The pulse 144, broad, soft, and weak, so as to be rather an undulation than a pulsation. The respiration 30, and so shallow, that the chest scarcely appeared to move. The tongue was dry and rough, and of a brownish red. The skin sweated copiously. He gave rational answers in a fluttering voice, but immediately afterwards always fell into a little incoherence. His movements were tremulous, and, though otherwise exceedingly tranquil, he tossed his arms about, and requested that his wrists might be tied together to prevent this involuntary action. He complained of coldness in the lower ex-

tremities, which however were sufficiently warm, though cooler than the rest of the body.

It appeared that he worked with his father as a blacksmith, at Lambeth, but was not a shoeing smith: that two months previously he had drunk a large draught of cold porter, when hot and perspiring, and had not since been perfectly well: that three weeks previously he had been attacked by acute rheumatism, first of the lower and afterwards of the upper extremities, but had recovered sufficiently to walk with crutches, and on Tuesday last expressed to his friends how happy he was to find himself recovering so fast, and sat some time in the open air, on the bank of the river, drinking a pint of porter in the afternoon, and also lounged about the mews: that, early on the very same evening, a pimple arose on the left side of the nose, and became very hot and painful, and the next morning a blush of inflammation was observed around it, which rapidly grew more intense, and he felt exceedingly weak and ill: that he was brought to the Hospital on Thursday evening, and ordered colchicum by the apothecary. He assured me that he had never suffered or even run the risk of contracting any venereal affection, and was not aware of ever having taken mercury. He had experienced no head-ache, nor pain anywhere, except in his nose, the great heat and throbbing of which had distressed him; and at his admission he said his throat was sore.

Notwithstanding his youth and good constitution, and the excellent health in which he had been on the preceding Tuesday afternoon, with the exception of a rapidly declining rheumatism; and notwithstanding the intensely bright redness of the eyelids, upper parts of the cheeks, and around many of the pustules; I considered that the gangrenous aspect of the left side of the nose and of many of the pustules, the mild delirium, the tremulous movements and voice, the profuse sweating, and the want of force in the pulse, so different from its state in Dr. Roots's case when first prescribed for, indicated the employment, not of evacuants, but of means calculated to tranquillise and support. I therefore ordered m. l. of tinctura opii, with gr. x of the sulphas quininæ to be given immediately, and the latter to be repeated every hour.

In two hours I visited him again, but found the disease had made great progress in overpowering the system. The elbow, which had been red only before, was now suppurating: the pulse was 166, still smaller and fluttering, and the restlessness was extreme. I instantly gave him m. l. more of the tinctura opii, directing the sulphas quininæ to be continued, and as much strong beef-tea with eggs diffused in it to be supplied as he would take. Neither the nourishment, however, nor any more of the sulphas quininæ, could he be prevailed upon to taste: but he fell asleep soon

after this second dose of laudanum, and slept tranquilly, waking occasionally for a minute and turning on the other side, till four o'clock in the morning, when he became very restless for an hour and then expired.

As in the former case, the father was present at the inspection, and he would not allow the head to be examined, or any incision to be made which would disfigure. Many parts of the lungs were gorged with blood and frothy fluid, and the corresponding bronchial branches were very dark; numerous papillæ with pointed black summits were seen at the end of the ilium, and clusters of minute greyish-black points throughout the small intestines, and most abundantly at the commencement of the duodenum; and the walls of the left ventricle of the heart were very thick: but nothing was detected, either peculiar or important, or calculated to throw the faintest light upon the disease,—a disease, which to me I confess was truly awful, from its suddenness, rapidity, gangrenous symptoms, unknown source, and seemingly uncontrollable power.

While I was standing at the bed-side, considering in silence the case before me, its identity in nature with that which I had seen in March appeared certain, and the disease as certainly to be a specific eruptive fever. I therefore stated to the pupils that, while at the occurrence of the

former case I had only the idea of some deleterious agent without being able to imagine of what kind, I now felt satisfied that this agent in the two cases was a morbid poison,—a poison furnished by a living system under the same disease. I put the same questions to this patient and his friends as in the former instance, and received the same negative answers.

The nature and source of the morbid poison, of the existence of which I felt satisfied, remained a mystery; I could not even guess at them:—when, on the cover of the Medical Gazette for July 4th, I read, "Fatal Case of *Acute* Glanders in the Human Subject." It instantly flashed upon my mind that this must be what I sought.

The morbid poison could not have been generated, because the clean appearance of the patients, and the good circumstances and respectability of their friends with whom they lived, were such as to preclude the generation of any morbid poison. Although evidently acting but seldom upon human beings in this country, still its residence among us was certain, if it existed, for neither patient had been near persons from abroad. Yet no other person in the vicinity of either patient, or anywhere that either had been, was known to have had such a disease. The morbid poison and its residence among us, of which I entertained no doubt, together with the circumstance of its rarely

affecting human beings, now seemed fully explained by the supposition, that the disease was one common to some of our brutes; and the profuse discharge from the nostrils, and the tumours and tubercular pustules on the surface, agreed with the supposition, that this disease was the glanders.

I had no time, however, to open the number of the Gazette immediately; and, on calling upon Mr. Alcock, he enquired if I had seen the Gazette, because he had read a case in it which he thought might throw some light upon the two which I had so frequently mentioned to him, and the inspection of one of which he had witnessed. I read the case, and found my prepossession fully substantiated.

A fine, healthy corporal in the 2d regiment of Dragoons, the surgeon of which, Mr. Brown, is the narrator,—aged 38, suddenly awoke, while stationed at Caher in Ireland, in the night of the 16th of April, with rigors, head-ache, and slight irritability of stomach, which in the morning were joined by depression of spirits, general disturbance, and stiffness and severe and constant pains of all the large joints, aggravated on the slightest motion. The pains increased to an alarming degree, but especially in the left shoulder, which was somewhat tumefied at the scapula, but not inflamed. On the 24th, the tumefaction was considerable, and of a livid hue. Similar swellings,

but smaller, took place on the arms, legs, thighs and sacrum; all, like it, hard, insensible, and of a chocolate colour, and at first a slightly discoloured puffiness only, but becoming, after twelve or fifteen hours, of a deep vermillion, and soon of a dark brown; the integuments growing thick and callous, slightly cracking, and exuding a thin and acrid sanies. One precisely similar, and of large size, appeared upon the left temple, and the eye-lids became tumefied. "*The right nostril was gummed with an inspissated discharge.*" The "posterior fauces" were much inflamed, and nearly of a purple hue. On the 28th, several "*warty* pustules", acquiring about the size of a pea, arose high above the skin, in various situations around each of the tumefactions, particularly numerous and large over the right side of the neck and shoulders, and on the inside of the arms and thighs, and were found after death to be filled "with a violet-coloured inspissated lymph." The thirst was always great, the tongue foul and parched: the pulse from 88 to 96, full, but easily compressed: the blood, abstracted at the commencement, buffed, but much attenuated; the urinary and alvine excretions "always natural in every respect." "The copious exhibition of tonics and antiseptics" had not the slightest effect: and at the date last mentioned,—the 28th, many of the tumors, particularly that upon the shoulder, were rapidly running into gangrene; the pulse was scarcely perceptible, the surface bathed with a cold, clammy sweat; imperfect stupor, and mild

muttering delirium occurred, and he died upon the morning of the 30th.

Neither the thoracic nor abdominal viscera presented any vestige of disease, but, as there was in this case no impediment to a full examination, the head, extremities, and walls of the trunk were carefully inspected. A cluster of tubercles was found in the cellular membrane, exterior to the pericranium of the left superciliary ridge, and in the right frontal sinus, exactly, according to the veterinary surgeon of the regiment, similar to those observed in the frontal and other sinuses of the horse after acute glanders. On dividing the various livid tumors of the surface down to the bone, "the muscles appeared perfectly decomposed, and of a dark liver color, exhaling a peculiarly fetid odor, with points of purulent matter, as it were infiltrated everywhere through its entire substance, resembling much a hepatized or tuberculated lung"; and under each "was a cluster of grey circular tubercles, the whole composed of fine cellular tissues, enclosed in small cysts, proportionate in size and consistency to the extent and duration of the tumor, and firmly attached to the periosteum." The muscles generally, even perhaps the heart, appeared pale and flabby, "and the cellular membrane infiltrated with a yellow serosity."

"It appeared that the patient had had the sole charge of a glandered horse for some time, which

had been destroyed on the very evening of his attack; and that he had skinned him, and exerted himself a good deal in cutting up and burying the carcass. But these circumstances did not at first create the least suspicion, and his complaint was considered a very severe case of acute rheumatism, and treated as such."

If the two cases which occurred at St. Thomas's Hospital corresponded perfectly with each other, they did not less perfectly correspond with this; as perfectly, at least, as various cases of scarlatina, small-pox, and other specific fevers. I felt assured that an active investigation would discover that our two patients had been in the vicinity of a glandered animal, and proceeded without loss of time to the house of my own patient's father at Lambeth. The father was not at home, but I saw a friend of the family, who had accompanied the father to the hospital. He said that, though a blacksmith, the father was not a shoeing smith, and kept no horse, and that the son could never have been among horses. I requested him, however, to conduct me to the father's forge. This I actually found situated in a neighbouring mews. On inquiring of the father and his men whether there had been any glandered horses in the mews, near which the son might have gone, they shook their heads, and declared not. A youth, however, among them, who, I afterwards found, was the brother of the deceased, suddenly

said, "Why, don't you recollect there was a glandered horse in the next stable for six weeks, just next the corner where Tom used to work?" —and then shewed me, that the boards which separated the stable from the particular part where the poor fellow had always worked, and against which the horse's head had been, were so defective, that the discharge from the animal's nostrils had come through and occasioned so great a stench, that he frequently said he should be unable to work if the horse was not taken away. I learnt further, that, while it was being led to the knackers, about a month before the commencement of his rheumatism,—about two months before the affection of the face, and his death,—it fell down exhausted at the door of the forge; that he went out and patted it about the head as it lay, and took hold of the head while they all endeavoured to make the animal rise; that he had a habit of continually wiping his nose with the back of his hand, and for some time had been troubled with such pimples on his forehead and about the nose, as are common to persons of his age. The horse had not the farcy as well as the glanders, and became diseased from being placed in a stable of the mews in which were two or three glandered horses.

I was thus encouraged to spare no pains to ascertain whether Maskall, the first patient, had been near a glandered horse. No more mi-

nute address than Woolwich appeared upon the hospital books; but as I had been informed that he was a helper in stables, and brought to the hospital by a coachman, I anticipated little difficulty in discovering his connexions. I accordingly went to Woolwich in July, and, with the assistance of a friend in the medical department of the artillery, inquired at the inns and of a number of persons: but in vain. My friend inquired, during the next week, at several inns in the neighbourhood, and likewise in the dock-yard, as some one about the Hospital told me that he had heard the father worked there. But no person knew any thing of the case, or of the name of Maskall. Enquiries in London of all the Woolwich and Blackheath coachmen were equally unsuccessful.

I despaired now of obtaining any clue, when, accidentally mentioning the circumstances in October before some of the students, two informed me that they resided at Greenwich, and very kindly promised to commence a search. They did so, and fortunately met with somebody who knew an uncle of the lad, the tailor to whom he was apprenticed, and likewise the father. I instantly wrote to the latter, requesting to see him in town. He believed that his son had died of secondary symptoms of syphilis, and assured me that the poor fellow was always with his uncle the tailor, and could never have been in the way of horses. Before he left me, however, I sent for

the sister of the ward, satisfied that the father must be mistaken. It was from her that I had originally received the impression of the boy being a helper in stables. The coachman who came, as well as the father, with the lad, was said by the latter to be only the driver of the vehicle which was hired to convey him. But the sister stated that, late in the evening of the day on which he was admitted, after the gates were closed, a young man, dressed like a groom, came to the Hospital, very much heated, earnestly requesting to see him, and saying he was dearer than a brother. Before this young man left, the sister observed to him that she supposed they were in the same line of life; but he told her no, and yet, that, for the last eight months, Maskall had spent much more time in the stables with him than anywhere else. On taking leave, Maskall was heard to call him Richard. The father seemed much surprised at all this; and no doubt was entertained that we now possessed a clue. I afterwards, however, received two or three letters from the father, stating his inability to discover that his son had been near horses or been acquainted with any stable-people.

In the beginning of May, I sent a faithful and very intelligent person to Woolwich, for the purpose of making inquiries of the youth's uncle and any others in the place who might be likely to give him information. The uncle knew no friend

of his nephew who was among horses and named Richard, and the day was spent in equally fruitless inquiries among the various persons with whom the lad was said to have been acquainted. It was, however, ascertained, that the next-door neighbour of the uncle had a miserable worn-out poney, covered with sores, and kept in a filthy wretched shed opposite the two houses, for some time before the youth's illness; that this dragged a little cart in which he frequently got a ride, helping to harness the animal and going to it in the shed, and that it was sent to the knackers a few months after his death. This neighbour and his family declared that the animal was worn out with mere age, and were evidently disinclined to say much upon the subject. On sending the same person to Woolwich a second time, he learned from persons who could be depended upon, that the poney really had the glanders and farcy.

Although the friends did not remember whether the lad had any pimples on his face about the time of his seizure, the father distinctly recollected that he had been much troubled, some little time back, upon both his forehead and chin, with such as are common during the first years of puberty. Nothing is more possible, than that he still had some of these chronic pustules, and that glandered matter came in contact with one or more that were open.

I happened in the spring frequently to meet Mr. John Parrott of Clapham, and in the beginning of March to mention to him the two cases which we had last year in St. Thomas's Hospital, and my conviction of their having been instances of glanders. Two or three weeks afterwards, he said that he had the day before been summoned to a patient with a very severe acute affection of the knee-joint, apparently rheumatic, and that delirium was now beginning; that he had proposed for me to see the patient, but that the father declined it for the present. The next time I met Mr. Parrott, he informed me that the patient was no more, and had died, he was convinced, of the disease I had been speaking of to him,—the glanders. This undoubtedly was the fact, and the following particulars were obligingly given me by Mr. Parrott.

"Mr. John Vass, aged 23, a pupil of the Veterinary College, had under his care at Clapham, where his father resided, a horse affected, the father said, with 'farcy glanders'. The ring-finger of the right hand, and the absorbents and axillary glands, became inflamed and painful; but whether after any wound or abrasion could not be satisfactorily ascertained. The finger suppurated, and was opened; the aperture healed quickly, all the inflammation subsided, and in a few days he was considered free from complaint, except that his temper was irritable and his appetite somewhat im-

paired. But in a few days more he began to feel headache and pains in his limbs, particularly in the right-knee. On the following day, (March 27,) Mr. Parrott first saw him, and could detect no tenderness, swelling, hardness, nor trace of previous wound in the extremity originally affected. The pain in the knee was very severe, and aggravated by motion, but unattended by heat, swelling, or redness. The pulse was quick and full; the tongue white and moist; the skin hot, and bedewed with sweat; the urine scanty, high-coloured, and turbid; the countenance anxious; the head painful; and there were signs of cerebral disturbance, together with extreme restlessness; the throat was sore, and covered with aphthous specks; the palpebræ were swollen, and the eyes much suffused. All these symptoms continued with unabated violence for eight or nine days; and in the mean time, numerous soft swellings took place in the extremities, the small joints became painful and rather red, the right kneeenormously swollen, the absorbents of the right arm knotted, painful, and in many points distinctly fluctuating. *A copious sero-mucous discharge, occasionally a little bloody, occurred from the eyes and nose, the schneiderian membrane was excessively red and nearly excoriated, and the eyes closed.* A pretty abundant eruption, very similar to small-pox, but larger, and *hard*, appeared in different parts, but particularly in the neck. There was scarcely any sleep, but occasional delirium, and

at length convulsions, and the patient expired on the 7th of April, while changing his linen. Unhealthy pus was found in the absorbents of the arm; the bursa of the knee contained a large quantity of pus, with flakes of coagulable lymph, a considerable abscess existed on the inner side of the knee-joint, and the periosteum was detached to the extent of between three or four inches. No other parts were examined."

It may be useful here to present, from a veterinary writer, a description of violent acute glanders in the horse and ass. "The pituitary is very red, very much inflamed, and presents little erosions, which take place rapidly, and become chancres, if we must in compliance with custom so call them, with edges thicker and more exuberant than those of the milder form of the disease. Sometimes the lips and the end of the nose swell, and afterwards the ulcerations commit more extensive ravages, and give rise to a discharge of a purulent appearance, and occasionally of a disagreeable smell. A fetid, purple, and perhaps bloody sanies, is mixed with it from time to time, at least in some instances, and at length the nasal membrane looks gangrenous. The discharge continues, and becomes more abundant; even blood issues from the nose. The sublingual glands, which are much swollen in all the forms of the

disease, are more painful than in the mild acute glanders. The conjunctiva and nasal eye-lid (membrana nictitans) are at first inflamed, injected with blood, and afterwards acquire a violet hue; the eye-lids swell, and the eyes discharge. The local phlegmasia soon extends to the surrounding parts; respiration becomes laborious, the superficial vessels successively congested, and the animal dies, in spite of all we can do, frequently in a few days, at other times after a longer or shorter interval. If the disease is protracted, the symptoms occasionally, though rarely, relax, and the inflammation declines; the animal then appears partially to regain its powers, and may be to a certain degree useful: but the state of the pituitary membrane, and of the *auge*, and the permanence and the character of the nasal discharge, show that the acute stage has degenerated into the chronic. It is in this form especially, that attacks of glanders may be considered epizootic. That violently acute glanders is always speedily fatal, and never becomes chronic, is disproved by the following fact. In a stable of eighteen horses and three asses, all of which were affected, ten died within the first days of the attack; four, after the violence of the disease had abated, remained stationary for two months, and then were cut off by a return of the inflammatory symptoms,—a relapse into the acute stage. The seven which survived presented all the symptoms of chronic

glanders, and worked in the country nearly a year, when it was thought proper to kill them"*.

In many cases of both the acute and chronic forms of the disease, the discharge is chiefly from one nostril, at least for a time, and this is said by some French writers to be almost always the left. That pustules may also take place in the acute disease of brutes, with gangrene of the external parts of the face, and swellings and suppurations in the extremities, is proved by the cases of two inoculated asses, presently to be detailed.

Sir Gilbert Blane, in his Select Dissertations, states, that "the only examples hitherto ascertained" of infections communicable from one species to another, "are the hydrophobia, and cow-pox:" † and Mr. Colman, though aware of the occurrence of "irritation in the human subject, from glanders and farcy matter, and the secretion of a large quantity of the same poison," declares in a letter, published in a work by Mr. Travers presently to be quoted, that "as far as his experience goes, the nostrils of the human subject are not susceptible of glandered ulceration or inflammation."

* Dictionnaire de Médecine et de Chirurgie Vétérinaires. Art. *La Morve.*

† P. 213. 1822.

In no veterinary work that I consulted, could I discover any intimation of the occurrence of the disease in the human subject. Indeed the veterinary dictionary, just quoted, declares it to be peculiar to monodactylous animals *. On applying, however, at the Veterinary College, I was informed by Mr. Sewel that he had known *two* instances, and referred me to Mr. Travers's book on Constitutional Irritation for the particulars. They were cases of *chronic* glanders. The *first* happened in a veterinary student, who slightly injured his hand in examining the head of an ass, which had died of inoculated glanders. An ulcer ensued, and pain and inflammation of the superficial absorbents took place in a few days, and soon ceased. But the absorbents of the opposite arm became affected, and an abscess formed in it, and another at the lower part of the back. He became hectic, and at length suppuration occurred also in the lungs, in one of the kidneys, and successively in each knee-joint; after which he died.

Mr. Colman inoculated an ass over the maxillary gland, and at the margin of the nostrils, with the matter of the abscess in the arm, and likewise rubbed some upon the schneiderian membrane. Glanders and farcy were the result, and the animal died on the twelfth day of the experiment. Precisely the same was done with another

* P. 134.

ass by the patient's brother; but no effect ensued, as the matter was not employed for several days and had been left exposed to the air. He repeated, however, the experiment upon the same animal with fresh matter, and it perished of glanders and farcy upon the fourteenth day.

The first ass was about a year old: the second a year and a half. In the first, the maxillary gland became tender on the second day; more so, and likewise enlarged, on the third, when the nostrils began to discharge: in the second, the maxillary gland enlarged on the third day, and the lip at the spot of inoculation swelled; but the nostrils did not discharge before the sixth. In the first, an absorbent vessel, like a farcy chord, ran across the cheek from the gland, on the fourth day; and another, inflamed and enlarged, was felt inside the thigh of one hind leg on the sixth, so that lameness and "complete farcy" were established, although the virus had been applied solely to the head: in the second, the absorbents of the face were not affected, but those inside the thigh of one hind leg enlarged upon the eighth. In the first, another farcy enlargement took place upon the stifle of the same leg on the seventh day: in the second, the absorbents of the other hind leg inflamed on the tenth day, and several tumors formed in both thighs upon the twelfth. Anorexia, quickness of pulse, difficulty of breathing and restlessness occurred equally in both; but in the

second only is it mentioned that *pustules* broke out upon the lip, followed by ulceration, and the *sloughing* of a large portion completely off. Pus was found in the absorbents of the diseased thigh of the first: the second was not examined *.

As the farcy was induced in the two asses no less than the glanders, I shall take the liberty of subjoining an account of this disease also from a veterinary work. "The farcy generally appears in the form of small tumours, called *buds* by farriers, or small ulcers, about the legs; sometimes on the lips, face, neck, or other parts of the body. These tumours are, in some cases, so small, so few in number, and create so little inconvenience to the animal, that for a time they escape observation; at other times they are larger, more numerous, painful to the touch, and spread more rapidly; and in these instances, a general swelling of the limb often takes place, particularly when the hind legs are attacked, and some degree of lameness ensues. The tumours or *buds* are at first hard, but soon become soft, and burst, degenerating into foul ulcers, of a peculiar appearance. The edges of the skin that surround the ulcer terminate abruptly, and the surface of the sore has a pale glossy appearance." "The lines

* An Inquiry concerning that disturbed state of the Vital Functions, usually denominated Constitutional Irritation. By Benjamin Travers, Esq., F.R.S., Surgeon to St. Thomas's Hospital.

of communication between the buds, or ulcers, are generally very observable; particularly when they occur on the inside of the limbs, where the superficial veins are large, as in the thigh. They consist of what the farriers call *corded veins*, but in reality are inflamed and enlarged lymphatic or absorbent vessels." *

The appellations of glanders and farcy appear to be given to the same disease affecting merely different parts. For farcy continually terminates at length in glanders, and glanders is often soon joined by farcy, as we have seen happened in the two asses inoculated from Mr. Turner; and the matter of both glanders and farcy is found in experiment to produce either or both diseases †. After the two asses were inoculated from Mr. Turner, the nostrils were first affected, but the absorbents of the extremities inflamed and suppurated in a few days. Farcy, on the other hand, is described as occasionally acute, and soon joined by glanders. "The commencement of farcy," says Mr. White, "is sometimes more violent than has yet been described. The limbs swell to an enormous size; foul ulcers appear in various parts; the nose swells, and discharges fetid matter; and

* A Treatise on Veterinary Medicine. By James White. pp. 7, 8.

† Mr. Colman has not only made experiments proving this, but asserts that he induced glanders in a healthy ass, by transfusing into it the *blood* of a glandered horse.

the horse breathes with difficulty, from the swelling and ulceration of the nostrils. This malignant kind of farcy is not very common." "When it does happen, however, it speedily destroys the animal." *

The three cases of acute glanders which I have detailed, may be considered as instances also of acute farcy, on account of the suppurations which occurred in the extremities. In the chronic case now quoted from Mr. Travers's book, the symptoms were those of only the farcy form of the disease, but in the *second* chronic case, the disease began as farcy, and at length produced the symptoms of glanders.

"Nimrod Lambert, a healthy hackney coachman, æt. 32, in January, 1822, infected a chap on the inside of the right thumb, by inserting it into the nostril of a glandered horse, to pull off a scab. He remembered to have afterwards wiped the thumb with a wisp of hay. In the space of six hours, he was seized with violent pain and swelling of the thumb; it inflamed rapidly, upon which he applied a poultice to it, and took some salts. On the third day he was suddenly taken ill whilst driving, with cold shivers and giddiness, and states that he entirely lost the use of his limbs for seven hours. At this time his arm pained him

* l. c. pp. 9, 10.

much all the way up, and on the following day it was streaked with red lines, and excessively swollen. The arm-pit was also much swollen and tender. In the evening of the fourth day he was carried to Guy's Hospital, where he lay during twenty-four weeks. Superficial collections of matter formed successively in the course of the absorbents. The corresponding portions of the integument sloughed, leaving extensive ulcers which discharged an unhealthy and fetid matter. The glands at either angle of the lower jaw, and those of the groin became swollen, and he was much afflicted with pain between the eyes and down the nose, and exulcerations of the membrana narium, attended with discharge. During the progress of the local disease he had much constitutional illness. He totally lost his appetite, and was oppressed with nausea; complained of severe pains, with swimming in the head, and occasionally wandered in mind. He had also much pain through the whole course of the spine, especially in the region of the kidneys. His urine was thick, and discoloured, and fetid; his motions were slimy and purulent. Expecting to die, he quitted the Hospital, and lay at home the remainder of the twelvemonth, in a state of great emaciation, from the continued discharge of his sores, his inability to take food, and to procure any refreshing sleep, even with the assistance of opiates, which he took habitually. Despairing of aid from the profession, he applied to an experi-

enced female practitioner, who administered a decoction of herbs, which he invariably vomited, but to which nevertheless he ascribed his recovery. At the end of the twelvemonth, his health gradually returned, the arm began to heal, and he became comparatively hearty, and resumed his occupation, though with much inconvenience, owing to the distortion of his hand by the retraction of the thumb and forefinger, in the cicatrization of a long line of abscesses, reaching to the middle of his upper arm. After six weeks, this cicatrix ulcerated afresh, and healed slowly. He is still subject to wandering pains in the head, both sides of the neck, loins, and groins: is not so strong and so fleshy as formerly, but has a good appetite. He has a great heaviness and disposition to sleep during the day, and at the end of two years and a half from the breaking out of the disease, considers his constitution broken, and despairs of being ever again the man he was." An ass was inoculated by Mr. Sewell with the matter of this man's sores, and died glandered.

That the chronic diseases in these two cases was that which is called glanders or farcy, according to its situation, cannot, I presume, be disputed, because the disease induced by the secretion of the diseased animals produced a secretion in the men which again induced the original disease in other animals. It is right, however, to mention, that Mr. Travers relates these cases as

examples of mere "irritation", such as arises from poisonous wounds in common dissection, and not as a specific disease, or the result of a *morbid* poison; and remarks that "the intervention of an animal of a different species, preserving the contagious quality in its morbid secretion, yet insusceptible of the specific disease, is truly extraordinary." It would be so unquestionably, if the fact. But to suppose a disease, produced by the matter of a disease of another system, and engendering matter again producing the original disease in a third system, not to be identical with the original disease, is to me impossible. The correspondence, however, of the symptoms, in the various cases which I have laid before the Society, with the symptoms of the disease, in both the acute and chronic form in which it appears in brutes, is, I trust, too perfect to leave any doubt that the human race is susceptible of the disease. A third case is related in Mr. Travers's book, by the patient, Mr. Nollen, a veterinary surgeon of Kidderminster, which in all probability was also an instance of the disease; but as no experiment was made with the matter secreted, and the symptoms were comparatively mild, its specific nature cannot be proved.

"I had occasion to administer a ball to a horse affected with glanders. At the time, there was a slight abrasion of the skin on the joint of my thumb, which I suppose became inoculated from

coming in contact with some of the discharge from the horse's nostrils, for in a few days it became a painful sore, the inflammation having a very unhealthy appearance. The sore was poulticed, and in a day or two an eschar was formed, on removing which an ulcer was exposed, having several small pits or cells, containing a thin, semi-transparent fluid; this sore was followed by many others of a similar description, affecting chiefly the hand, the glands of the axilla, the nates, and the neighbourhood of the knee-joint. This took place on one side, the other arm and leg not being affected. The irritation, I presume, from so many sores, affected my general health considerably, with loss of appetite. My medical attendant prescribed the blue pill, and the use of the warm bath, which I continued for several weeks, until having occasion to go to town, I consulted some of the first medical men, who recommended me to drink the decoction of sarsaparilla. I took it for about a month: after that time no ulcers appeared, those already existing assumed a healthy appearance, and healed quickly, and from that time to this I have had no return of the disease."

The symptoms of chronic glanders in the horse are thus detailed by Mr. Blaine*. "An increased and diseased secretion from the membranes of one or both nostrils, continually flows in small or

* The Outlines of the Veterinary Art. Edit. 3. 1826. pp. 158, 9.

large quantities. This discharge is seldom at first perfectly purulent, but is more glairy, thick, and not unlike the white of egg, and it sometimes continues thus for a long time: at others it soon becomes purulent, but even then there is always a degree of viscidity and gluiness in it, that sticks the nostrils together, as it were, from its tenacity, differing from other pus, and which very circumstance strongly characterises the complaint. The general color of the schneiderian membrane becomes changed, first to a violet color, and afterwards to a leaden hue. As ulceration takes place, the discharge becomes bloody, sometimes sanious and offensive, which is always the case when the bones prove diseased. From an absorption of the morbid matter from the nose by the lymphatics of the part, the lymphatic maxillary glands under the jaws, through which these vessels pass, become swollen and tender, and as one side of the head only is sometimes affected with the glandered running, in such case one lymphatic gland only is tumefied, and of course, the one of the affected side." "The disease sometimes remains long without producing ulceration; at other times, on the contrary, an ulcerating process quickly appears. The ulcers have a very peculiar character; they are not unlike the venereal chancre, but usually commence by small limpid bladders, which soon ulcerate into a sore of a particular kind; and where there are several of them, they are always placed high in the course of the lymphatics."

"As the disease advances, much of the schneiderian membrane becomes ulcerated, till at length even the bones prove carious. At an uncertain period of the disease, the lungs become affected, when hectic symptoms soon follow, with tubercles which ulcerate; frequent vomicæ also form and burst: there then appears cough, emaciation, and weakness in the loins; the hair feels dry, and falls off on being handled; the matter from the nose increases in quantity, becomes sanious, stinking, or bloody, and is coughed up by the mouth also, and in this state the animal dies."

As two cases, and I might almost say three, of this disease have occurred within my own observation in so short a space of time, and a fourth has been recorded within the same period, all in different places, I cannot but imagine that the disease, though rare, is not of *extreme* rarity; more especially when I reflect that it is likely not to be recognised and was not in the two instances at St. Thomas's Hospital, and that it may be communicated by an abrasion of the cuticle so slight as to escape notice. I presume that an abrasion is necessary to its production, because most veterinary surgeons are satisfied by experience that glanders matter never excites the disease in the horse, even if applied to the pituitary membrane of the nostrils, while the surface is entire.

After I made the facts of this paper a subject of frequent conversation, two of my friends, Dr. Kind, a German physician resident in London, and Mr. Jacob, an excellent German scholar, who both had witnessed with me the cases in St. Thomas's Hospital, and to whom I subsequently mentioned my belief that I had ascertained the nature of the disease, have discovered some similar cases in Rust's *Magazin für die gesammte Heilkunde.*

The first was recorded in the 11th volume, 1821, by Dr. Schilling, regimental physician at Berlin.

I. Martin Rennspiess, aged 34, an artillery soldier, employed particularly in the care of horses at a veterinary school, felt unwell, and complained of rheumatism, catarrh, colic pains and thirst, but did not lie by. At the end of six weeks, on getting up one day, Nov. 11th, 1821, he felt weak and giddy, and was unable to stand. Red streaks were observed on the cheeks, and a red spot upon the ala nasi. The latter by the next day had spread all over the nose, and headache and fever came on. Before night, a livid vesicle, (*ein blau-schwarzes Blätterchen,*) appeared upon the ala, where the red spot had been, and gradually increased. The nose, eyelids, and soon the whole face, were swollen, hard, of a dingy red, and shining; and on the third day, he was taken to the Hospital.

A number of livid vesicles of the size of peas,

and with *very hard* bases, were now seen on the nose; the integuments around were much indurated, the tongue loaded with yellow fur, the pulse 76 and weak, the spirits dejected, deglutition difficult, and there was great thirst.

On the 4th day, the swelling was increased, the tip of the nose gangrenous, the upper lip beset with vesicles, and *an offensive corrosive discharge was taking place from both nostrils.* Blood taken from the arm presented a firm buffy coat.

On the 5th day, the whole nose and upper lip were gangrenous, the swelling was greater, and there were pustules on the forehead like those already described (*neue Pusteln von derselben Beschaffenheit wie die schon früher beschriebenen.*)

On the 6th, more pustules arose on the forehead; the nose and upper lip were black, cold, and senseless.

On the 7th, red spots, passing quickly into suppuration, arose on various parts, especially on the fore-arms and legs. The nose was quite stopped up: the discharge from it mixed with blood, and so corrosive, as to destroy a portion of the slough of the upper lip. The breath stank.

On the 8th, the pustules throughout the body and extremities were more numerous and livid;

the pulse was 140; nearly the whole face gangrenous; and in the evening he had a very offensive evacuation from the bowels, and soon afterwards expired.

Dr. Schilling seems satisfied that the disease arose from the contagion of a glandered horse *, many of which wretched animals, kept for dissection and operations in the veterinary school, the patient had been looking after for some months, and had frequently, he said, washed out their nostrils.

Under the sternum in the seat of the thymus, and upon the tendinous portion of the left temporal muscle, a gelatinous yellow mass, similar to what is often met with in the cellular membrane of anasarcous persons, was found. "The pericranium, especially of the frontal bone, was sown, as it were, with yellow pustules (tubercles?) of the size of millet seeds, and the bones below were sound." "The bones of the nose were decidedly carious, while the others of the face were healthy. Under every part of the skin where the earliest pustules took place, the cellular membrane was changed to a gelatinous mass, like that already mentioned. Pustules (tubercles?) were found

* The paper is entitled *Merkwürdige Kranheits-und Sections-Geschichte einer wahrscheinlich durch Uebertragung eines thierischen Giftes erzeugten Brandrose.* A curious engraving is given, which, coarsely executed as it is, shows the affection of the face to have been precisely the same as in the cases at St. Thomas's.

even in the substance of the muscles, projecting, as it were, from their fibres, and containing a puriform lymph, but not clustered like those on the head. The fibres around were half liquefied."

As a postscript, the Editor relates the following case, by Dr. Weiss, Kreis-Chirurgus * at Neumarkt.

II. Gottfred Kliesch, aged 19, of delicate constitution, the son of poor parents, had always worked in various places, but latterly been employed in a farmer's stables at Bischdorf. According to his father's very imperfect account, he had frequently had eruptions, and frequently glandular swellings in his neck, many of which had suppurated. Whether any slight ulceration still existed on his face or neck, is not said. He had been vaccinated with success †.

* In most of the German states, some of the physicians and surgeons of every district are appointed under the title of *kreis-physikus* and *kreis-chirurgus* (district physician and district surgeon), at a very moderate salary, to examine into and report upon all medical occurrences which concern the government,—violent and sudden death, epidemics and endemics, &c.—all occurrences which belong to State Medicine, whether Juridical Medicine or Medical Police; in short, to act as a kind of coroners on an extended scale.

† The two patients at St. Thomas's, and Mr. John Parrott's patient, had also been vaccinated with success. I mention this, because the cow-pock is said by some to prevent or mitigate the distemper in dogs, and we might fairly enquire

For several weeks he had complained, the father said, of pain in the head and back, weariness, and weakness of his limbs, loss of appetite, and disturbed sleep, all which he ascribed to lifting heavy sacks of corn; but continued at his occupation, a part of which consisted in looking after a *glandered horse*, which was with an ox in a separate stable. The stench, in cleaning out the manger, was such as continually to make him sick, and at last he took to his bed. He was sent to his parents Oct. 12th, that he might be taken better care of, and got worse daily till the 24th, when Dr. Weiss was requested to see him.

"I found him", says this gentleman, "in a

whether it has any power against the glanders. Mr. Copland Hutchison stated in the Society that the late Earl of Liverpool's game-keeper at Walmer had satisfied himself experimentally, twenty years ago, that cow-pock prevented the distemper in dogs; and I published in the Annals of Medicine and Surgery for 1817, London, a letter to myself, from the late Mr. Honywood, one of the members for Kent, in which he said, that both he and Mr. John Ward of Berkshire, so well known in the sporting world, from whom he learnt the fact, had employed the cow-pock for this purpose several years with uniform success, either in altogether preventing the distemper or in rendering it a very mild disease. I have no knowledge of my own upon the subject, but it deserves investigation. This Mr. Copland Hutchison began, by vaccinating half a dozen very young puppies belonging to his neighbours, when at Deal; and he corresponded with Dr. Jenner. The puppies lived in perfect health for two years, and he then left the place and lost sight of them.

miserable bed: although the room was filled with the smoke of juniper berries, there was a bad smell around the patient. He lay emaciated, in a mild delirium, his eyes dull and sunk, his nostrils somewhat extended, their inner lining, as far as the outer edge, covered with superficial ulcerations, some of which also were seen on the lips; the tongue and teeth were encrusted with yellow sordes. *From the mouth and nostrils there was an abundant yellow puriform discharge;* and all the glands beneath the lower jaw were swollen. All over the body, but especially on the lower extremities, were pustules, healed in some places, ulcerated in others and foul. The genitals were healthy, and the inguinal glands moderately enlarged. His strength was very prostrate; he answered me rationally, but in so weak a voice as scarcely to be understood; respiration was laborious and difficult; the breath very offensive; the abdomen rather tumid, but not tender. Black liquid blood, extremely offensive, was discharged involuntarily from his bowels; the skin was dry and hot; the pulse frequent and weak. He died the next day."

Rust subjoins his conviction that both these patients died of the glanders caught from the diseased horses which they took care of*.

* Both cases are published also in Hufeland's *Journal der practischen Heilkunde*, 1822, März. The engraving of Rennspiess is there likewise.

Through the kindness of Mr. Green, I have a copy of an excellent drawing of Dr. Roots's patient by Mr. Kearney; and

III. In the 17th volume, published 1824, is the case of Martin Tesmer, aged 25, who, from the 15th to the 27th of July, 1823, suffered from pain in his limbs, side and head, thirst, loss of appetite, restlessness, and a pricking sensation at the tip of his nose.

About the 29th, inflammation of the left cheek, the nose, and upper lip, and part of the right cheek, came on. Around the nose the skin was particularly hard, dark, and painful. There was considerable pyrexia, &c. August 1, the inflammation had spread, and the tip of the nose seemed suppurating. On the 2d, every symptom was more intense, and the sore on the tip of the nose looked fungous and dirty. The lad, being particularly questioned, stated with much difficulty, that he had some time before had the care of two diseased horses, one of which was affected with a copious discharge from the nostrils, and that he had several times been sprinkled with this, while giving it medicine.

On the 3d, the end of the nose was covered with a hard, painful, gangrenous scab; several pustules as large as peas and filled with yellowish fluid (phlyzaceous), arose around it, and on the upper lip: the whole face was swollen, and the inside of the nose inflamed. On the 4th, the entire face, and inside of the mouth, were inflamed

two equally good, the one representing the face during life, and the other after death, presented to me by Mr. Alcock.

and swollen, nearly half the nose destroyed, and the rest covered by a gangrenous scab. There were more pustules on the cheeks, some discharging an acrid ichor: the fever was much more intense. Blood taken from the arm on the 5th day, showed a strong inflammatory buff. On the 6th day, the swelling and destruction of the face proceeded, and even the gums and tongue were implicated: pustules, like those of the face, arose on the chest and extremities.

On the 7th, *a copious stinking ichor proceeded from the nose and mouth;* the gangrene extended; more pustules appeared upon the forehead, the angle of the lower jaw, and the body. The pulse was 130, and small; there was delirium, and colliquative sweats.

On the 8th, the symptoms were all greatly increased; the pulse could not be counted, and death took place. Previously and subsequently to his decease, the stench was excessive; and on this account the body could not be inspected. The horse was examined, and found to have a swelling in the glands of the neck, with a copious mucous and purulent discharge from the nose. When killed, the right lung was full of pus, and the left of abscesses and *tubercles*, although no disease was visible in the mucous membranes of the nostrils.

Dr. Seidler, the regimental physician who attended and published the case, lays particular

stress on the circumstance, that the skin of the patient's nose, and adjoining part of the cheeks, was at all times excessively thin and irritable. It is highly probable, therefore, that some excoriation of the face existed at the time it was sprinkled with glanders matter*.

It is also mentioned, that the proprietor of the glandered horse, who had frequently visited it in the stable, but never touched it, was seized with pyrexia; had several boils; fell into a typhoid state, diarrhœa and delirium; and at last various spots appeared all over the body, many of which became pustules.

In the second part of the 14th volume, is an account, by Dr. Tarozzi of Ostiano, of eleven persons affected, in 1818, in a similar manner, and of whom all but one died, after visiting, with about thirty-five others, an ill-ventilated stable 20 feet square, containing three cows and ten horses, one of which had laboured under an offensive discharge from the nostrils for a twelvemonth, and none of which had left the stable for three months. Violent pyrexia, pains, spasms, boils, and at last a large carbuncle, generally characterised the first stage; gangrenous vesicles and typhus were the chief features of the second. These were not the precise symptoms observed in the preceding cases; and as the parish priest, who closely attended on

* A very coarse and singular engraving is given of this patient's face.

all the patients, also caught the disease, and as a discharge from the nostrils is not stated to have taken place in any one instance, and the accounts are in many respects defective, I dare not give an opinion that this disease, any more than that of the proprietor of the horse which infected Tesmer, was really glanders. It might have been an affection similar to a carbuncular epidemic which seemed to be derived from brutes,—from skinning sheep and oxen that had died of *blutseuche* or *milz-brand*, at Merseburg, in 1822, and described in the first part of the same volume; to the cases of butchers and others affected with gangrenous erysipelas, pustules, carbuncle, &c. apparently from contact, even without abrasion, with the blood of diseased oxen, related by M. Morand*; to the disease described by MM. Enaux and Chaussier, under the title of *Pustule Maligne*†; and to a disease which proved fatal to two men whose hands, though sound, and washed four minutes afterwards, were wetted, in the performance of venesection, with the blood of a cow labouring under *milz-brand*, and in whom the chief local affection was peritoneal inflammation and effusion‡.

* *Histoire de l'Académie Royale des Sciences*, 1766.

† *Méthode de traiter les Morsures, &c. suivie d'un précis sur la Pustule Maligne*, 1785.

‡ Hufeland's Journal, 1822. März. Pages 89 sqq. In the same article in which these cases, related by Dr. Meier, Kreis-physikus at Brandenburg, are published by Hufeland, is a short essay by Dr. Wilhelm Remer, Professor at Breslau,

upon those diseases of brutes that are communicable to mankind—*Ein Beitrag zu den bisherigen Beobachtungen von krankheiten der Thiere, welche sich dem Menschen mitgetheilt haben.* Dr. Remer enumerates, besides *Hydrophobia* and *Cow-pock*, the *Milz-brand* or Rinderpest; the *Glanders*, feeling himself justified, from the case of Gottfred Kliess, which he narrates, to declare, in italics, *Der Rotz der Pferde steckt Menschen an;* the *Plica Polonica* or Trichoma, which he asserts may be communicated from man to hairy brutes, and from these again to man; and a cutaneous disease (perhaps the *Itch*), which he says was given in France by a lion to its keepers, and, after its death, to those who skinned it. I have said, perhaps the itch, because M. Biett relates, in his lectures (see the *Lancette Françoise*), that several years ago some camels were taken to the *Jardin des Plantes*, with a very severe itch, of which some of them died, and which was caught by the keepers. Whether, as Dr. Remer gives no reference, this was the occurrence alluded to by him, and he learnt it merely by report, one animal being mistaken for another, I cannot say. Willan mentions, that a "violent form of scabies is excited by the contact of dogs, cats, hogs, and other animals, affected with *mange*."

In regard to diseases communicable from men to brutes, Dr. Remer enumerates, besides the *Plica Polonica*, measles, which he says have been given to sheep; and the *Plague*, which, if authors are to be relied upon, has been caught by domestic brutes. Those which we receive from brutes, may probably all be given back. We have an experiment, by Magendie, in reference to hydrophobia; and the experiments related in this paper in regard to glanders and cow-pock.

The glanders are generally believed to belong to that class of contagious diseases which, under peculiar circumstances, may be generated without contagion. Mr. Coleman states, that in the expedition to Quiberon, in 1795, the horses had not been long on board the transports, which were crowded with them, before it became necessary to shut down the hatches; the consequence of which was, that some were suffocated, and all the rest became either glandered or farcied.

Dr. Ashburner related the following circumstances to the same effect, in the Society, during the conversation which ensued after the paper was read, and has obligingly committed them to writing at my request

"It is well known that there are in Bombay several large establishments for the sale of Arabian horses, which are brought to the island from the Gulf. Batches of these, varying in number according to the size of the vessel in which they are shipped, are conveyed by speculators, for sale, to the Bengal market. In August, 1823, I went from Bombay to Calcutta in a ship of 350 tons burthen, on board of which were twenty-eight well-selected horses. They were placed between decks, and my cabin commanded a view of their accommodations. With all the advantages of a free ventilation, fresh breezes, and fine weather, the neighbourhood of these animals was by no means a pleasant situation. An intelligent Arab accompanied them as supercargo. He told me that he always chose for his speculations that period of the year in which the shortest passages were made, the months of July and August; for, during long voyages, it might occasionally become necessary to shut the hatches; and when horses were, under such circumstances, pent up, they were not only affected as to condition, but were apt to generate serious diseases. Within three weeks from the time of embarkation, my Arab friend had his venture safely lodged in the stables of Malachi Lyons, in Calcutta, where some hundreds of horses were continually on sale. They appeared to be as well, and in as good condition, as when I saw them in the harbour of Bombay. I learned that they were all particularly examined before they were admitted into the stables; for the proprietors of the establishment considered extreme caution to be requisite, in order to prevent the possibility of an infectious disease creeping into his stables.

"I heard some time afterwards, that a vessel had arrived with twenty-three horses on board, glandered. They had been nearly six weeks on their passage, and it was stated that they were all healthy when they were embarked. They had experienced rough weather, and had suffered from confinement.

I heard, that in consequence of the refusal of the stable-keepers to admit these animals, it was thought expedient to destroy them. This is hearsay evidence, but, I believe, quite true. The next year my brother sent me two horses from Bombay, which accompanied a freight of other Arab horses. The ship had an unfavorable passage, and several of the horses she brought round died before her arrival in the Hooghly. One of those consigned to me was of the number. I was assured all of them had been embarked in healthy condition. It was reported that glanders had been generated among these animals, and I had an opportunity of seeing several of them which were placed under the charge of a stable-keeper, who kept them apart from his other horses. They were out of condition, miserable in appearance, but had no disease of the skin. There was cough, the eyes were watery, and there was a discharge from the nostrils, without, however, a very high degree of inflammation of the mucous membrane. Professor Coleman had, before I left England, taught me to distinguish an ecchymosed state of this membrane from the inflammation of glanders. In these horses there were no vibices in the nostrils, nor did I discover ulceration. The maxillary glands were enlarged. The horse that was landed, consigned to me, was in this state; and as he was an Arab of beautiful symmetry, the stable-keeper parted with him to a person who hoped to cure him by taking him into the country. I heard some time afterwards, that none of these horses recovered, and that it became necessary to destroy them.

"It was not in my power to be more certain than I was, that these horses left Bombay in a healthy state. The enquiries I made upon the subject left no doubt on my mind. Indeed, when we consider the shrewd character of the Arab merchants, the large stake they have at risk, and the obvious interest they have to avoid all sources of contamination for their valuable property, I think there is sufficient reason to conclude that they would not embark diseased horses, to add the expense of freight and provender to a certain loss; nor would they carelessly submit healthy horses to the chances of disease, either in stables or on board ship."

AN ACCOUNT

OF THE

DISSECTION OF THE PARTS

CONCERNED IN THE

ANEURISM

FOR THE CURE OF WHICH DR. STEVENS TIED

THE

INTERNAL ILIAC ARTERY,

AT SANTA CRUZ, IN THE YEAR 1812.

By Mr. RICHARD OWEN, Surgeon.

COMMUNICATED BY

BENJAMIN TRAVERS, Esq. F.R.S.

Read June 1, 1830.

BEFORE entering into the detail of this dissection, it may be convenient to recapitulate some particulars of the case in which this operation was for the first time performed *.

Maila, a negro woman, imported into the West Indies in the year 1790, had, in 1812, a tumour on the left hip, over the sciatic notch, nearly as

* Medico-Chir. Trans. Vol. V. p. 422. Art. XXV.

large as a child's head, and pulsating very strongly. It had commenced about nine months before, and the woman submitted to the operation proposed by Dr. Stevens on the 27th of December 1812.

An incision about five inches in length was made on the left side, in the lower and lateral part of the abdomen, parallel with the epigastric artery, and nearly half an inch on the outer side of it;—the peritoneum was separated from its loose connection with the iliacus internus and psoas magnus; it was then turned inwards to the division of the common iliac artery. The internal iliac being found, and compressed betwixt the thumb and finger, the tumour ceased to pulsate, and began to disappear; a ligature was passed round the vessel, by means of a probe, and it was tied about half an inch from its origin. The tumour disappeared almost immediately after the operation, and the wound healed kindly. About the end of the third week the ligature came away, and in six weeks the woman was perfectly well. The operation was neither very difficult nor very tedious; the woman did not complain of much pain, nor did she lose an ounce of blood. There was no difficulty in avoiding the ureter; when the peritoneum was turned inwards, the ureter followed it.

The woman, after continuing to enjoy a good

state of health for ten years, died of an affection of the chest in the year 1822. Dr. Stevens being apprised of this circumstance, examined the parts within the pelvis, in the presence of Dr. Kerr and other medical gentlemen of the Island of Santa Cruz, and by injection ascertained that the Internal Iliac Artery had become impervious at the part where the ligature had been applied; and he also found, that the ischiatic artery was continued in the character of a ligamentous chord to the place of its exit from the pelvis; but that the glutæal artery was pervious at its origin.

With this proof of the successful result and due effect of his operation, and having detected the vessel that was the true seat of the aneurism, (which until now had been supposed to be of the glutæal artery,) the pelvis was removed with a view to a future and further examination.

Accordingly, soon after his arrival in this country, Dr. Stevens, at the suggestion of Mr. Lawrence, deposited the preparation in the Museum of the Royal College of Surgeons, and the dissection being intrusted to me, he requested me to communicate the particulars to the Society in whose memoirs the case originally appeared.

As a preparatory step, I threw in some fine injec-

tion by the arteria profunda, in order to facilitate the tracing of anastomosing channels; it ran out very freely by the opening which had been made in the origin of the glutæal.

Within the pelvis, the external and internal iliac arteries were given off in the usual manner. An incision being made into the left common iliac, and continued down to the part where the internal iliac became contracted, it was found there to have become completely obliterated. The ilio-lumbar artery appears to have arisen just above the part where the ligature had been applied, and the obliteration in consequence has not extended to the origin of the external iliac *.

In the state of a ligamentous chord, the internal iliac descended towards the ischiatic notch for the space of an inch, and then suddenly resuming its natural diameter, it again became pervious, and so continued for the extent of half an inch; the glutæal artery arising from the lower part of this space; a sacro-lateral vessel from about the middle; and the obturator artery from the upper part of it. The latter vessel was, however, entirely obliterated, but the sacro-lateral artery was pervious,

* This open state of the artery above the ligature has been observed even where no artery has arisen in that situation. See Hodgson, Dis. of Arteries and Veins, p. 199.

of the size of a crow-quill, and passed inwards to the second sacral foramen; whilst the glutæal artery, of its natural size, received close to its origin two vessels as large as the preceding, given off from the sacro-lateral artery, near the third and fourth sacral foramina of the left side.

The anastomoses of the sacro-lateral arteries with each other, and the sacro-median were large and tortuous. Immediately after the origin of the glutæal artery, the ischiatic, obliterated and chord-like, passed on to the lower part of the ischiatic notch;—the sanatory processes set on foot by the application of the ligature being uninterrupted by the enfeebled current of blood passing from small canals to a large one.

Many vessels met with in the course of the dissection of the glutæus maximus and medius, were found to have received the injection last thrown in, and were preserved. The glutæal artery was in a healthy condition, and of the natural size; but an elongated tumour, situated between the tuberosity of the ischium and the great trochanter, indicated the true seat of the original disease. This tumour, in length three inches and a half, and about two-thirds of an inch in breadth, was of the sciatic artery*, and consisted of layers of

* The branch which seems to continue the course of the artery, and accompanies the ischiatic nerve.

condensed cellular membrane, and the peculiar fibrous arterial coat.

It contained a quantity of dark-coloured, granular, not lamellated, coagulum, which, when removed, shewed the internal surface of the sac to be somewhat irregular, and raised in small patches by the deposition of soft matter. In some places it appeared to retain the smooth character of the arterial lining membrane. From the ischiatic notch to the tumour, the artery was completely obliterated, its texture altered, and the remains of its cavity filled with indurated and partly calcareous matter. From the lower part of the tumour the sciatic artery was continued down the posterior part of the thigh of an uncommon size, nearly as large as the femoral artery in front; its calibre did not however correspond with the apparent magnitude, for its coats were thicker, by at least one half, than any artery of the same size with itself. It was obliterated for about the space of an inch below the sac, and became pervious after receiving an anastomosing vessel from the arteria profunda.

A vessel ramifying between the glutæus maximus and medius, and distributing branches to these muscles, was connected to the commencement of the sac, from which it had probably arisen: it did not, however, open into the sac, but after becoming contracted near the point of attachment,

it there gave off a small artery to the quadratus femoris, and received its blood by anastomosing near the crista ilii with a superficial branch of the glutæal artery. A smaller vessel was similarly attached to the lower part of the aneurismal sac, but neither did it communicate with that cavity; for the blood which it received from branches ramifying in the neighbourhood was diverted from the sac by a small branch given off at the point of attachment.

The notice of these circumstances may, perhaps, be considered unnecessarily minute, since sufficient has been observed to place beyond doubt the existence and cure of an aneurism situated as originally described, and the obliteration of the internal iliac artery in consequence of the application of the ligature at the part stated in Dr. Stevens's Memoir.

The structure of the sac, and the circumstances of the strong pulsation observed in it before the operation, and its rapid subsidence after, lead to the conclusion that the aneurism was of the true kind, consisting of an uniform dilatation of the coats of the vessel without any partial rupture. The subsequent condition of this aneurism must also be considered an exceedingly rare occurrence: ten years after the operation for its cure, it still exhibits a cavity containing loose coagula, and in its parietes the structure of the arterial coats are

distinctly visible. Another circumstance noticed in this dissection, viz., the open space maintained by the collateral circulation in the trunk of the artery between the ligature and the aneurism, is, however, in accordance with observations made in various dissections after the operation for aneurism. In the account given of Mr. Hunter's method of performing the operation for the cure of the popliteal aneurism *, on examining the limb of the patient, who died fifteen months after the operation, it was found that the femoral artery was impervious above the ligature as far as the origin of the arteria profunda; but that "below this part the femoral artery was pervious down to the aneurismal sac, and contained blood, but did not communicate with the sac itself, having become impervious just at the entrance." I have attentively examined the preparation, which, from the interest attached to it, has been repeatedly figured; the artery becomes much diminished in size as it approaches the sac. In the valuable paper by Sir Astley Cooper, "On the Anastomosis of the Arteries at the Groin" †; a circumstance more nearly resembling the appearances in this dissection is described ‡. In a case

* By Sir Everard Home, in Trans. of a Society for the Improvement of Medical and Chirurgical Knowledge. Vol. I. p. 138.

† Medical and Chirurgical Transactions. Vol. IV. p. 425.

‡ See also on this subject, Hodgson, Dis. of Art. and Veins. p. 277. *et seq.*

of aneurism of the femoral artery, which was cured by tying the external iliac, about an inch of the femoral artery, just below Poupart's ligament still remained open, allowing a partial current of blood through it, the artery having become a simple ligamentous chord above and below this part.

The operation of securing the internal iliac artery appears now to have been performed five times; and the practicability and propriety of the operation in certain circumstances is placed beyond doubt. But even when the present was the only recorded case, it was not wanting advocates; who, after having made themselves acquainted with the professional character of its originator, gave him the credit he so justly deserved. Sir Astley Cooper, many years ago, spoke of it in his lectures in the following terms:—"This operation, one of extraordinary difficulty, has been performed by Mr. Stevens, of the West Indies; none but a man endowed with the knowledge Mr. S. possessed, would have dared to undertake such an operation: but Mr. Stevens was educated by Mr. Burns of Glasgow, he was brought up in his dissecting room, and this it was that led Mr. S. to the idea of doing it."

Sir Astley has subsequently examined the preparation, and having himself laid open the remains of the sac, he immediately addressed the following note to Dr. Stevens.

"MY DEAR SIR,

"I have examined your preparation in the presence of Mr. Clift, and Mr. Owen, and am perfectly satisfied of the existence of the aneurism for which you operated, and of the obliteration of the internal iliac artery which you had tied.

"ASTLEY COOPER."

Royal College of Surgeons,
May 12, 1830.

The second operation on the internal iliac was performed by Mr. Atkinson, of York, at the County Hospital in that city. This case is detailed in the 28th volume of the Medical and Physical Journal; and an analysis of it is also given in Cooper's Surgical Dictionary. The patient, a muscular man, æt. 29, underwent the operation on account of a glutæal (?) aneurism, on the 12th of May, 1817; he continued many days entirely relieved from the distressing pain of the tumour;—about the 10th day after the operation, coagula began to be extruded from the wound, and, as his dissolution approached, the discharge had a more florid and fluid appearance. He died of complete exhaustion on the 31st of May, nineteen days after the operation.

Upon dissection, the ligature was found to have been disengaged, the knot including a small frag-

ment of (apparently) the artery; the internal iliac was completely separated *; the upper orifice presenting an appearance of slight thickening and adhesion; "the sides of the internal iliac above where the ligature had been applied, on separating them, had a granulous and greyish coagulated appearance."—"A certain space of separation was visible betwixt the upper and lower parts of the internal iliac artery."—"In the lower part of it, the artery was wider, and the coats evidently *more diseased;* and a coagulum of grumous blood was manifest at the mouth of the lower artery, which, being gently removed, exposed this (now more open) mouth, which again, after a short interval, was filled with more fluid ichor from the sac below."—"A bougie, passed into the lower diseased artery, within the pelvis, in a line with the superior one, was slowly introduced, and easily made way into the exposed sac, from whence the blood had been cleared;—so that it became obvious that a regurgitation of blood might easily happen, and which no doubt was the case, from the sac up the artery into the pelvis, at a given time after the ligature had separated." p. 271.

That the internal iliac was actually secured in this case there can be little doubt; and if the vessel had been in the same healthy condition as in the negress Maila, the operation might have

* Severed.

been attended with equal success. It is to be regretted that the nature of the disease in the coats of the vessel is not mentioned; and with respect to the seat of the aneurism, as it does not appear that the vessel from the distal side of the sac was traced in this dissection, nor any of the sound branches of the internal iliac artery, and considering the direction in which the bougie was passed down the internal iliac into the aneurismal sac, I am inclined to suppose that the aneurism in this case was also of the ischiatic artery.

The third case is noticed in Averill's Operative Surgery, p. 39, and in Cooper's Surgical Dictionary, Ed. 5, p. 155, in the following terms: "The internal iliac artery is also said to have been tied, with success, by an army surgeon in Russia, upon whom the Emperor Alexander has settled a pension, as a reward for the skill displayed in the treatment of the case."

The operation has also been performed by Mr. Thomas, of the island of Barbadoes. The preparation has been sent to this country, and deposited by Sir Astley Cooper in the Museum of Guy's Hospital.

The fifth and most recent case is detailed in the American Journal of the Medical Sciences, No. II. February, 1828, Art. V. p. 304. The interest of the subject induces me to make a copious

extract from this case. The article is entitled "Successful Case of Ligature of the Internal Iliac Artery, for the Cure of Glutæal Aneurism. By S. Pomeroy White, Surgeon, Hudson, New York."

"In the early part of October last, (1827,) Jacob Van Volkenberg, aged 60, by trade a tailor, came to Hudson for the purpose of obtaining surgical advice. He presented to our view a tumour about the size of a child's head, located upon his left hip, directly over the sciatic notch. He stated that it was of ten months' standing, and that he experienced no pain from it. His general health had been good, except that he suffered from rheumatism. Upon making an examination of the tumour, the skin was found not discoloured, fluctuation was perceptible; but there was no pulsation. The absence of the last symtom rendered it difficult to decide upon the nature of the case; and accordingly we postponed giving an opinion until a consultation could be held with his family physician, Dr. Hicks, of Columbiaville. The doctor stated that the tumour could be removed by pressure, when small;"—he presumed that it contained pus, and proposed opening it; "and as that was the only way of ascertaining unequivocally the nature of the disease, we acquiesced. He accordingly punctured it, and nothing but florid blood made its appearance. A probe was passed in, and an aneurismal sac was found, about five inches deep. It was also discovered, that the

parietes of the sac were very firm and unyielding, which accounted for the absence of pulsation. After allowing a pint of blood to be discharged, the orifice was closed with a suture and adhesive plaster. It was observed that after this, and also subsequent discharges of blood, that the sac would fill again, and the tumour resume its usual dimensions." Having unanimously concluded that the disease was aneurismal, and with "*an encouraging although a solitary precedent, in the case of Mr. Stevens, of the Island of Santa Cruz,*" "the operation of tying the internal iliac was accordingly concluded upon, though the patient's age was considered a circumstance that would operate against its success. He at first declined having the operation performed, but as profuse hæmorrhage repeatedly supervened, he became weak and alarmed, and requested us to pursue whatever course we deemed most expedient.

"On the 23d of October he was laid upon the table, and an incision was made of a semi-circular form, commencing two inches to the left of the umbilicus, and ending near the external ring. It was seven inches in length, and the convexity of it was towards the ilium. After dividing the skin, cellular substance, and superficial fascia, it became necessary to secure a few small arteries. The tendon of the external oblique being exposed, was next divided, and then the internal oblique and transversalis with its fascia. The peritoneum which

now presented, was detached from the iliacus internus and psoas magnus muscles with the fingers, and was pressed with its contents towards the right hypochondriac region by the assistance of my father. The external iliac was immediately felt, and by passing the finger towards the sacro-iliac symphysis, the internal iliac was distinctly recognized. The artery was then exposed with the handle of the scalpel, and the ligature passed under with the Philadelphia needle, one inch from the bifurcation. Instead, however, of drawing up the needle-part with the hook, I found it more convenient to take it with the dressing forceps. One ligature being passed, it was found necessary, from the great depth of the parts, (being about five inches,) to pass down the knot with Dr. A. E. Hosack's knot-applicator. The ligature was then firmly tied, and the parts were brought together with sutures and adhesive plaster. In this operation the same difficulty existed as in the case of ligature of the common iliac by my distinguished friend, Dr. Mott of New York, viz. the constant protrusion of peritoneum from abdominal compression, created by the struggles of the patient. Some pain in the bowels and fever came on a few days after the operation, which was removed by venesection and a laxative. Union, by the first intention, had taken place to a considerable extent at the first dressing on the eighth day. A considerable quantity of pus was discharged during the first four weeks, at the expiration of

which time the ligature came away. The tumour has discharged its contents gradually, and the parts have assumed their natural appearance. The patient has so far recovered his usual state of health, as to be able to walk about his neighbourhood."

"Hudson, New York.
Dec. 1, 1827."

Although the patient is said to have suffered no pain from the tumour, it is afterwards stated that he was lame in his left limb from rheumatism, and being a man of rather intemperate habits, was liable to falls upon his left nates.

Whilst in the United States, Dr. Stevens had opportunities of knowing that the unimpeached character of Mr. Pomeroy White obtained for his Memoir the unequivocal credit of his professional brethren; but he is of opinion that in this case also the aneurism was of the ischiatic, and not the glutæal artery.

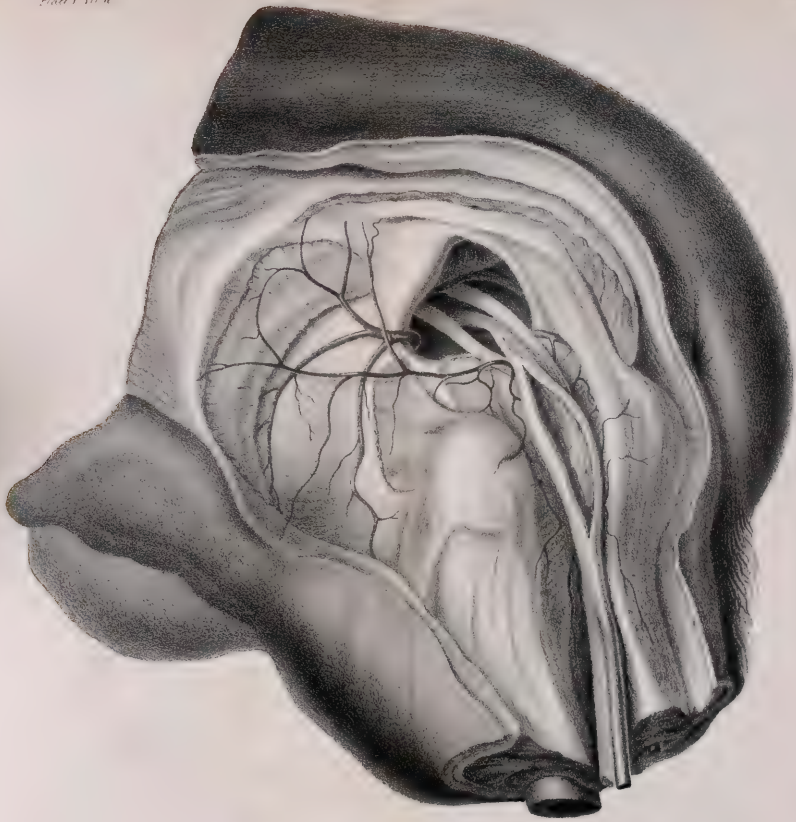
Description of the Plates.

I. The remains of the aneurismal sac.

II. The vessels within the pelvis.

a. Internal iliac artery laid open.
b. Origin of the ilio-lumbar artery.
c. Part obliterated where the ligature was applied.

Plate I. Vol. II.



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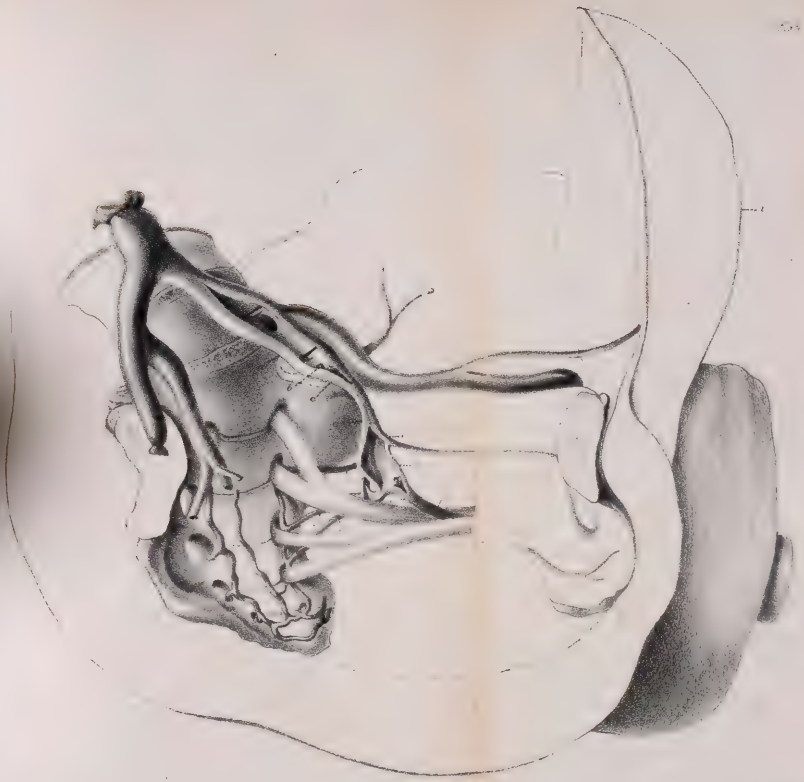

d. Open part of the internal iliac artery below the obliteration.

e. Obturator artery obliterated.

f. Glutæal artery laid open.

g. g. g. Sacro-lateral arteries communicating with the glutæal artery, and internal iliac.

h. Ischiatic artery obliterated.

i. Outline of a bag or pouch of the common integument formed in the left hypogastric region, in consequence of a hernial protrusion of intestines subsequent to the operation, and chiefly attributable to neglect on the part of the patient in not wearing the proper bandage. She suffered no material inconvenience from this circumstance.

END OF VOL. XVI.—PART I.

C. Woodfall, Printer, Angel Court, Skinner Street, London.

REMARKS

ON

OMENTAL HERNIA,

WITH CASES.

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THE omentum has been found to enter into the formation of nearly all the varieties of hernia, but from its attachments, and position, it is less frequently met with in those which pass out through the inferior apertures of the abdomen or pelvis. It escapes more readily through the umbilicus, through those preternatural ventral openings which are sometimes found in the anterior parietes of the abdomen, and through the inguinal ring and crural arch. It is more frequently encountered in umbilical than in inguinal, and in inguinal than in crural hernia: indeed in the latter situation its occurrence is comparatively rare.

As it naturally descends lower in the left than

in the right side of the abdomen, it, of course, escapes more readily through the left inguinal opening than through the right. This fact however appears to be much exaggerated by Arnaud, when he asserts, that of twenty omental inguinal herniæ, nineteen will be found in the left side. Were I inclined to hazard an opinion on this point, I would state, as the result of my own experience, and of the published cases of this disease which I have read, that in about three-fourths of the cases, the epiplocele will be found in the left groin. There are, besides, a few rare cases, in which the omentum has escaped on both sides in the same patient, and in the same side it has been found to protrude through both inguinal and crural openings, so as to form two distinct tumours.

This disease is much more frequent in its occurrence in advanced than in early life. In children, the omentum is so short and imperfectly developed, as rarely to reach to the umbilicus; while in adults, and particularly in old people, it not only covers the bowels, but also, sometimes, extends a considerable way into the pelvis. I have, however, met with three cases of congenital rupture in very young children, in one of which the tumour appeared to be composed wholly, and in the other two partly, of omentum.

The first, which was an inguinal hernia of the

left side, was easily reducible, and had all the characters of being omental. The others contained both intestine and omentum, were observed at birth, and projected through the umbilicus into the sheath of the cord. The application of a ligature close to the umbilicus of the child, after the contents of the tumour had been carefully returned into the abdomen, was successfully adopted in one of the cases; but in the other, the pain became so acute, that the ligature had to be removed in two hours. On the separation of the funis, a considerable deficiency of the abdominal integuments was discovered, and the tumour appeared to be covered, only, by the hernial sac, the external surface of which was ulcerated. During a severe fit of crying the sac burst, and permitted the escape of a small portion of omentum, and a fold of intestine. These were easily returned into the abdomen, and after several weeks, closure of the umbilical aperture, and ultimately cicatrization of the integuments were effected.

The external characters of an omental rupture, and the symptoms by which it is accompanied, are in many respects essentially different from those which distinguish an intestinal protrusion. The omentum being less sensible than the intestines, is said, when inflamed, or strangulated, to be seldom attended by the same urgent and alarming symptoms, as in the other form of the disease.

It cannot be denied that, an enterocele is more hazardous to the patient than an omental rupture; nor will this seem wonderful when we consider, the great difference in the structure and functions of these parts, and how essential to the support of life are, the free and uninterrupted movements of the alimentary canal. Nevertheless, I am induced to assert, from the cases which have come under my own observation, that in strangulated epiplocele, the symptoms both local and general, are often extremely severe; and that we shall fail in our duty, in many instances, if we do not adopt a more prompt and active treatment, than what seems to be followed, by some of the chief surgical authorities of the present day.

Garengeot alludes to a case which occurred to M. Chevalier, surgeon in Paris, in which, from the external characters of the tumour, and the severity of the accompanying symptoms, the intestine was supposed to be strangulated. When the operation was performed, the omentum only was found in the sac *. Pott, who with the exception of Mr. Lawrence, has written more fully and correctly on omental rupture than any other author with whose works I am acquainted, has also detailed several cases of a similar kind †.

* Traité des Operations de Chirurgie, Tome I., p. 256. Paris, 1731.

† Chirurgical Observations, Vol. V. London, 1775.

It is seldom that an omental attains the magnitude of an intestinal rupture; because in the latter species of the disease, the enlargement of the tumour, in general, depends on the repeated escape of new portions of bowel, while in the former, the progressive augmentation of volume occasionally observable, is more frequently to be attributed to the morbid enlargement of the displaced part. When the tumour is composed wholly of omentum it usually presents an unequal surface, has a soft doughy feel, and when long protruded, or irreducible, a slightly pyriform shape. It is more elongated, and less flattened or rounded in form, than an enterocele of the same size, and it also wants the tension and elasticity by which the other is distinguished.

When the tumour is small, recent, and unchanged in structure, it is often ill defined; and when in this state, it occupies the situation of the inguinal opening, it is apt to be mistaken for a partial enlargement of the spermatic cord; and even in an old irreducible epiplocele, the tumour sometimes presents externally, a smooth and polished surface, with the tension, and other characters of an intestinal rupture. This is especially observable when the sac is distended with fluid; but even when this complication exists, we shall seldom fail, unless the tension be very great, in recognizing the hard and irregular omentum

through the interposed fluid. The same uniformly smooth surface is occasionally met with, when the omentum contained in the sac is not consolidated, or otherwise morbidly changed, but is simply enlarged, from hypertrophy, or obesity. Here, however, the absence of tension and elasticity, and the peculiar flabby state of the tumour, will render the diagnosis comparatively easy.

The omentum, particularly when loaded with fat, escapes from the abdomen more readily than the intestines, is reduced with greater difficulty, and requires a stronger spring truss to prevent its reprotrusion. The marked difference which attends the reduction of an intestinal and an omental rupture, is also very characteristic of the two diseases. In the latter species, the tumour passes up very slowly, and without noise; and the pressure requires to be continued until it has entirely disappeared; being the reverse of what takes place in an intestinal hernia.

In employing the taxis in the reduction of an epiplocele, as great caution is requisite, in avoiding unnecessary violence or force, as when the tumour contains intestine. Although the omentum is neither so sensible, nor so important as the intestines, and is not so dangerous when injured, still its soft and loose texture renders it not so capable of resisting the application of force as a

healthy piece of bowel, and liable, therefore, when too much handled, to be contused and lacerated. I have seen one case, in which, from continued and powerful efforts at reduction, the omentum was lacerated in several places, and in another, the protruded part was livid and ecchymosed, from the extravasation of blood into its cellular texture. The contused omentum instead of being excised, was, unfortunately, returned into the abdomen, became gangrenous, and produced death.

On the sudden protrusion of a portion of omentum, especially when it occurs for the first time, we may expect to find the accompanying symptoms extremely urgent. Strangulation may be immediately produced, violent pain in the tumour and abdomen excited, with vomiting, hiccup, and obstinate constipation. In some cases an operation is indispensable, whilst in others, the distressing symptoms gradually yield, so soon as free alvine evacuations are procured.

E. G. * a healthy, unmarried woman, about 26 years of age, was suddenly seized, about three o'clock in the afternoon, when lifting a heavy piece

* I have mislaid my notes of this case, nor have I been able to obtain the Infirmary Journal in which it is recorded, but the leading facts are fresh in my memory, (although the case occurred in 1817,) and the above statement may be depended upon as correct.

of coal, with most acute pain in the right groin and belly. When I saw her about six, the pain had extended considerably, she had vomited once or twice, and the pulse was accelerated. There existed a small defined tumour, in the site of the right crural opening, which was about the size of a walnut, rather smooth and painful, but with hardly any tension. The abdomen was not tumid, but she could scarcely tolerate pressure in the vicinity of the tumour.

She was admitted into the Royal Infirmary about nine o'clock of the same evening. A consultation was called at ten, and with one exception, all the gentlemen present considered the tumour to be a hernia, and recommended blood-letting, the warm bath, and the taxis, which were immediately had recourse to.

About twelve, as the symptoms were unrelieved, it was agreed that the operation should be forthwith performed. As, however, the gentleman who believed that the tumour was not a hernia, maintained his opinion with a good deal of determination and asperity, the operation was postponed, until the opinion of one of the senior surgeons of the Infirmary, who was absent, could be obtained. Before this was accomplished, it was found, that in consequence of a dose of oleum ricini which the patient had taken before admission, one or two

copious evacuations were procured, on the surface of which oil was observed floating. The vomiting and pain of belly gradually subsided, but the tumour continued tender, undiminished, and irreducible. Leeches, cold applications, &c. were employed, and the pain of the tumour by degrees mitigated, but from this time she ceased to enjoy good health, was frequently attacked by dragging pains in the abdomen, vomiting, colic, and constipation. When I saw her last in 1824, she attributed all her sufferings to the tumour, which was then the size of a pigeon's egg, had an irregular doughy feel, and was immoveably fixed in the situation of the crural opening.

From the history of this case, and the state of the patient and tumour subsequent to the first attack of strangulation, I am convinced, that the disease was omental hernia. At first, the severity of the symptoms led to the belief that intestine was included; the free evacuation of the bowels, however, put an end to this opinion.

As acute pain was readily excited in the tumour by pressure, or by slight external violence, she was unable to bear the application of a bandage. By maintaining firm and steady pressure, by means of a truss with a hollow pad, we sometimes succeed, in preventing the further escape of omentum, in promoting the absorption or otherwise

favouring the return of the displaced portion, in guarding it from external injury, and in hindering the descent of the bowel. This practice can only be had recourse to, however, when the irreducible epiplocele is of small size, and even then, we shall often find symptoms of such severity supervene on its employment, that it cannot be persisted in. I have seen several instances, where mechanical ingenuity has been exhausted in the construction and alteration of bandages and trusses, to obviate the painful effects of sustained pressure on omental herniæ, but where it had to be discontinued, from the local and constitutional disturbance which it excited.

The reduction of an epiplocele may be prevented by a variety of causes.

1st. By adhesion of the omentum to the inner surface of the body, or neck of the sac. This occurrence, although often met with, is not so very frequent as some surgeons would have us to believe. When it does happen, however, the adhesions are generally very intimate and extensive, and prove an insuperable barrier to reduction. Sometimes, the adhesions exist in the form of bands or bridles, by which a fold of gut may be bound down, or encircled, and strangulation produced. In other cases, as stated by Baudelocque, Arnaud, and Callisen, the same occurrence may

happen, from a knuckle of intestine passing through a ruptured opening in the adherent omentum.

2nd. Reduction may be prevented, by enlargement of the omentum from engorgement of its vessels. When the hernial aperture is so small as to maintain a moderate pressure on the omentum, without producing strangulation, we find, that, in process of time, its loose and cellular texture becomes engorged and tumid, in consequence of its continuing to receive a free supply of blood by the arteries, while its return by the veins is prevented, or at least much impeded. This state of parts may exist for a considerable time, before any material change is produced in the structure or connections of the displaced omentum. In process of time, however, whether from a continued constriction of the parts, or from external injury, the portion of omentum implicated in the tumour becomes morbidly changed, adherent, or complicated with the effusion of fluid into the hernial sac.

3rd. That part of the omentum which passes through the neck of the sac, is frequently compressed into a hard smooth cord, while the portion in the sac itself remains loose and capable of being expanded. This is considered by Pott, as the most frequent impediment to the reduction of an

epiplocele. The slender pedicle which the pressure of the hernial aperture produces, and the coiled state of the mass of omentum within the sac, must render reduction always difficult, and often impracticable.

4th. The return of the displaced omentum may be prevented, by its having undergone a diseased enlargement, the size of which bears no proportion to the diameter of the opening through which it must pass. Although the omentum may continue in a hernial sac for months, and even years, unchanged in texture or appearance; yet, more frequently, the unnatural position in which it is fixed, the pressure and contusions to which it is externally exposed, the continued engorgement of its vessels, from impeded venous circulation; and especially the repeated attacks of inflammation to which it is subjected, gradually convert it into a hard thickened irregular mass, which possesses none of the characters of the healthy texture. I dissected, some years ago, a large inguinal epiplocele of the right side, which had been irreducible for fourteen years. Many ineffectual attempts were made during the patient's life to return the parts into the abdomen; and the failure was attributed more to the supposed existence of firm and extensive adhesions, than to the size of the tumour. It was ascertained, after death, that no part of the omentum was adhering

to the sac, but it was so enlarged, and disorganized, that reduction could not be accomplished, until the inguinal ring was divided for nearly three inches. The induration which takes place in the diseased part is sometimes so great, as to resemble scirrhus; and may be accompanied either with, or without, adhesions to the sac. When adherent, the morbid change is generally greater than when it is unattached to the sac.

5th. An epiplocele may be also irreducible from adipose enlargement of the omentum, without any *morbid* alteration of the affected part. This state may be accompanied with, or independently of, general obesity. The size of the tumour is sometimes very great, but it is now and then liable to such sudden and decided variations in bulk, as are observable in none of the morbid conditions of the omentum. This does not depend on the alternate protrusion, and replacement of additional parts of the membrane, but on constitutional causes. Whatever produces general emaciation, will also cause a considerable absorption of the fatty matter of the rupture, so as greatly to reduce the size of the tumour, and occasionally to permit of its return into the abdomen. Sir A. Cooper succeeded in a gentleman, who was reduced from hydrothorax, in returning an old irreducible hernia *: and in the following case, which

* See Lectures by Tyrrell, Vol. III. p. 18.

came under my own observation, a similar termination was effected, after an attack of fever.

W. N. aged 58, was seized on the 3rd of January, 1829, with violent pain in the abdomen, extending from the left groin to the epigastrium, with nausea, vomiting, and constipation. When visited on the 4th, the pain was constant and severe, increased by pressure, and confined to the left side, and the only relief he experienced was by bending the trunk and thighs, so as to relax the abdominal muscles. A doughy, rather painful, tumour, about the size of a hen's egg, was discovered passing from the left inguinal canal, by a hard and narrow neck. This tumour had existed for nearly twenty years, and was often accompanied, especially on exertion, or when the bowels were constipated, with smart attacks of colic and vomiting —the pain usually commencing in the tumour, and extending to the abdomen.

The disease had all the characters of an omental hernia. It was probably from the tumour being so long irreducible, that its replacement was prevented, by adhesions: nevertheless, as it was possible that the symptoms of strangulation depended on the escape of a new portion of omentum, which might be returned, with relief to the patient, the taxis was gently, but ineffectually employed. He was bled from the arm, ad deliquium, leeches

and fomentations applied to the tumour and abdomen, and purgatives, and enemata of various kinds employed for three days, before the bowels were freely opened, or the urgent symptoms relieved. After this, the tumour continued undiminished, but the pain gradually subsided.

I did not see this patient again, until the beginning of March last, when, in consequence of the great increase in the size of the tumour, he called to request my advice. It was larger than the fist, had a soft doughy irregular feel, was of a pyriform shape, and by its bulk and weight, and the dragging at the stomach which it seemed to excite, when he assumed an erect position, created very great uneasiness. As he had become very corpulent, I attributed the increase of the tumour to this cause, and recommended the use of a suspensory bandage, and spare diet.

In the following month, he had an attack of fever by which he was confined for six weeks, and of course greatly emaciated. When convalescence took place, I was surprised to find the tumour so much reduced, below its original size, that I was enabled, by very moderate pressure for a few minutes, to return it fairly into the abdomen. A truss was afterwards applied, and the return of the disease prevented.

In irreducible herniæ of large size, whether intestinal, or omental, the patient is not unfrequently subject to smart attacks of colic, with pains in the tumour, after taking a hearty meal. When the rupture consists wholly of omentum, the pain commences almost immediately after eating, but when of intestine the uneasy feelings are longer in appearing, and seem to take place, only, when the contents of the intestinal canal are passing through the tumour. Besides these symptoms, an irreducible epiplocele is often accompanied by severe dragging or twitching at the stomach, and by repeated vomitings; in consequence of the stomach being compelled to follow the motions, communicated to the *fixed* omentum, by the intestines and abdominal muscles. These symptoms are, also, most urgent after meals, because, from the distention of the bowels, the stomach is pushed up towards the diaphragm, and the omentum put more completely on the stretch, and also rendered more convex externally by the pressure of the intestines.

As the stomach and colon become accustomed to the restraint arising from this unnatural fixture of the omentum, we occasionally find, that the urgent symptoms gradually diminish, or even altogether disappear. This fortunate result has been, however, less frequent in my practice, than

from the assertions of Pott, Boyer, Cooper, and other writers on this subject, I was led to expect. It cannot be denied, that the membranous viscera of the abdomen are less firmly fixed in situ, admit of greater freedom and latitude of motion, and may, therefore, be more completely and extensively displaced, from their natural position, than those of a different structure. The mobility of the stomach, and that part of the colon to which the omentum is attached, is well known, yet, there are limits, beyond which these parts cannot be displaced, without deranging, or altogether impeding, their functions, and of course exciting painful, and even dangerous symptoms.

When the distension of the abdomen is moderate, an irreducible epiplocele may cease to produce any disagreeable symptoms; but when the stomach is full, the bowels constipated, and unusually distended with flatus, or fæces, when much straining of the abdominal muscles occurs, we cannot fail to meet with very distressing symptoms. It is the liability of the abdomen and its contents to great and often to sudden variations in size, even in healthy individuals, that enables us to explain the repeated recurrence of these painful paroxysms. They are generally more urgent when the omentum is suddenly, than when it is slowly, put on stretch; yet even in the latter state, they are sometimes marked and severe.

A few years ago, a woman about twenty-eight years of age, who came under my care for a different disease, had a considerable sized, irreducible, crural epiplocele of the left side. She had experienced for several years, repeated attacks of dragging at the stomach, vomiting, and constipation; but these were mild, when compared with the violent, incessant, and distressing attacks, to which she was subject, after she became pregnant. As the abdomen became more and more prominent, the severity of the symptoms increased. During the last two months of pregnancy, she was constantly confined to bed, and only experienced relief when she lay on her left side, with the trunk bent forward, and the thighs drawn up to the abdomen. She could not extend herself in bed, nor assume an erect position, without immediately exciting vomiting and pain at the stomach. The relief she experienced after delivery, was very decided.

When an inguinal epiplocele has been long irreducible, we sometimes find, that the omentum becomes so altered in structure as to produce, by pressure and irritation on the spermatic cord, a diseased state of the testicle, with or without effusion into the tunica vaginalis. In the following case, this combination existed, and had nearly proved fatal, from an attempt to obtain a radical cure of the hydrocele.

J. A., shoemaker, ætat. 53, had been subject for about nine years to a small, irreducible, inguinal rupture of the right side. During this period he had, besides, repeated attacks of pain in the tumour, colic, and constipation, occasional uneasy feelings in the testicle. For the last year, these gradually increased in severity, and extended to the back; the testicle began to enlarge, and was painful when handled. He experienced some relief from the use of a suspensory bandage, but the swelling continued to increase.

When he called, on the 28th of Dec. 1821, to solicit my advice for the first time, the scrotum was distended to the size of two fists. The tumour had the pyriform shape, the tense, elastic feel, and the transparency of a hydrocele. The inguinal canal was considerably distended, by a firm substance, apparently the neck of a tumour, which was both seen and felt to be distinct from the general swelling of the scrotum. This tumour, which passed about an inch and a quarter in front of the cord, to which it was apparently adherent, was larger than, and nearly the shape of, a goose's egg; somewhat irregular on the surface, of a firm texture, and painful when pressed.

I punctured the scrotum with a trocar, and when the fluid was evacuated, discovered that the testicle was enlarged to more than double its na-

tural size, exquisitely painful to the touch; and that the epididymis, and spermatic cord were thickened. As the patient was greatly incommoded by the bulk of the swelling, he was anxious to have such means adopted as would prevent its recurrence; but from the enlargement and irritability of the testicle, and the existence of a painful omental rupture on the same side, I decidedly opposed any attempt to cure the hydrocele by injection. The diseased state of the cord and testicle, to which the effusion was to be attributed, appeared to depend on the continued pressure of the displaced and diseased omentum. As this hernia was not, however, producing very urgent symptoms, I did not think it prudent to interfere with it, but recommended such local applications as were likely to restore the testicle to its natural condition, and in this way prevent the re-accumulation of fluid in the tunica vaginalis.

My advice was not complied with, and I therefore heard nothing further of this patient for about three months, when I was desired to visit him at his own house. I then learned, that four days before, in his anxiety to get rid of the hydrocele which had regained its former size, he had persuaded a surgeon after puncturing the scrotum, to inject the sac with wine and water. Acute pain in the testes and back was immediately excited, and was so severe, that the injection could

not be retained above two minutes: it was therefore speedily, and I believe, completely evacuated. Although for several hours the pain continued severe in the scrotum, very little tumefaction took place, and only a faint blush of redness was observable around the margin of the puncture.

On the following day he had a smart rigor, succeeded by febrile excitement, obtuse pain in the hernial tumour, and slight nausea. Ineffectual attempts were made to open the bowels, the pain gradually extended to the abdomen, which became more and more intolerant of pressure, and slightly tympanitic.

At my visit on the third day, the symptoms of abdominal inflammation were well marked; he vomited incessantly, and had a small wiry pulse, and an anxious countenance. The hernia was rather larger than when I formerly examined it, but otherwise it was unchanged, except by being exquisitely painful on pressure. The severity of the symptoms was greatly aggravated, so soon as flatulent distension of the belly took place.

The usual antiphlogistic treatment was actively and judiciously employed from the commencement of the attack by the attending surgeon, but with little or no effect; and as it appeared that the patient's life was in imminent danger, I pro-

posed, for the following reasons, the immediate performance of an operation.

The tumour was tense and acutely painful, and although not in a state of active strangulation, still it was obvious that a considerable, and probably an injurious degree of compression, was maintained over the neck of the rupture by the pressure of the inguinal ring. It was probable, that before inflammation occurred, the inguinal canal was completely filled by, and adhering to, the omentum, and that the increase of size which necessarily took place during the inflammation was greater than the expansibility of the aperture would permit; a degree of stricture was therefore the consequence, which might add materially to the sufferings and to the danger of the patient; and for the removal of this state alone an operation might be beneficial. Might not also the operation by removing the superincumbent pressure of fasciæ, sac, &c. as well as by enlarging the inguinal ring, free the inflamed omentum of a source of painful and injurious compression, and place it in a more favourable state for subsequent treatment; similar to what is observed in subfascial and other deep-seated inflammations? It was evident, also, that the omentum within the abdomen was greatly on the stretch. The inflamed state of this membrane and the additional distension to which it was subjected by the flatulent en-

largement of the bowels, probably gave rise to the incessant vomiting and excruciating paroxysms of pain. These symptoms might be mitigated, if not altogether removed, could we succeed by an operation in relieving the omentum, and in permitting it to resume its natural situation and unrestrained movements within the abdomen.

On the contrary, I was aware, that the inflammation of the omentum was attributed to the stimulating injection employed for the cure of the hydrocele, and that it was not confined to the tumour, but had extended into the abdomen. In this respect it was certainly different from an ordinary case of strangulated epiplocele, arising from the sudden protrusion of the omentum, and of course greatly less favourable for an operation. Still, the critical situation of the patient, and the want of success in the active employment of antiphlogistic means, induced me to recommend an operation which held out a slight prospect of success, without materially adding to the danger of the patient.

I accordingly performed the operation about seventy hours from the commencement of the inflammatory symptoms, in presence of the attending surgeon and several of my pupils. The sac contained about half an ounce of moss coloured serum, the omentum was of a dark red colour,

of a pyriform shape, of a dense texture, covered by small granular pieces of fat, and could not be expanded as in the natural state. It was adhering firmly to the posterior surface of the sac, and the neck of the tumour was evidently much compressed by the external inguinal ring. I detached with the finger, and divided with the knife, these unnatural attachments, and being satisfied that the tumour consisted only of omentum, I divided the pedicle. By sponging with cold water the oozing of blood soon ceased, when I proceeded to enlarge the ring and to ascertain if it were possible to destroy the remaining adhesions, and return the omentum into the abdomen. A director was introduced between the edge of the ring and omentum, and the former part divided directly upwards. I then detached the remaining adhesions with a probe, and with little difficulty pushed the omentum before the finger fairly into the abdomen.

The patient vomited repeatedly during the operation, but only once after it was completed. In about four hours he was greatly relieved by a free bleeding from the arm, and had soon after, by means of the compound colocynth pill and an enema, several copious and offensive stools. From this time all the urgent symptoms subsided, and with the exception of a free suppuration of the sac, no untoward occurrence happened during the cure. In five weeks he was able to bear the press-

ure of a truss, which he still wears. When I saw him, a few days ago, he was in excellent health, and stated, that he had never experienced since the operation any of those distressing attacks of colic and dragging pains at the stomach, by which he was formerly so much annoyed.

When an irreducible omental hernia is complicated with hydrocele, it would appear, that the usual expedients for the cure of the latter disease cannot always be safely employed. The similarity of structure and contiguity of the affected parts is such, that when inflammation is excited by injection or otherwise for the purpose of producing a cohesion of the tunica vaginalis, it is liable to be propagated to the omentum or its sac, and give rise to alarming symptoms. It is also necessary to consider, before any operation is proposed, that as a preternatural collection of fluid sometimes takes place in the hernial sac itself, which may present all the characters of hydrocele, great caution is requisite in the diagnosis.

When the omentum is fixed to the sac by extensive adhesions, or when it is neither inflamed nor irritated, it is seldom that any great accumulation of fluid takes place. Sometimes, however, the sac is so much distended, as to prove an additional source of uneasiness to the patient. Pott

was repeatedly obliged to puncture the sac and evacuate the fluid, in order to remove the inconvenience arising from the enlargement and weight of the scrotum; and when this was neglected, gangrene was sometimes produced.

To distinguish, therefore, between hydrocele complicated with an irreducible epiplocele, and a collection of fluid in the hernial sac, is of some practical importance. In the former, the fluid gradually accumulates in the most depending part of the scrotum, and extends upwards, leaving, as in the above case, a separation more or less marked between the two tumours. But, when the accumulation takes place in the sac, the swelling commences below the inguinal ring, and proceeds downwards, unless the hernia is scrotal, when it will begin in the same situation with hydrocele. We may expect, however, to find, when the fluid is confined to the sac, that the tense swelling is greater and higher up in the groin, and that the irreducible omentum is more completely surrounded by it than in the other form of disease.

The propriety of the operation had recourse to in the preceding case, may to many surgeons appear questionable. We are told, that when the local symptoms of a strangulated epiplocele are severe, and when they seem to depend rather on

inflammation than on strangulation, an operation is generally useless, and frequently dangerous *. It has been already shewn, that even, in these circumstances, an operation may not only be necessary, but even highly successful; and, that the temporary exposure of a piece of inflamed omentum, in a hernial sac, is not so very dangerous as some surgeons assert. The operation will assuredly be more successful, when the omentum has protruded suddenly, and become strangulated by the immediate pressure of the opening through which it has passed; but even when the disease is of long standing and irreducible, the additional size it acquires when inflamed, or engorged, may cause over distention of the hernial aperture, and produce such painful and injurious constriction, that an operation may become necessary. In this state the symptoms are usually less rapid in their progress, but as soon as the tumefaction of the omentum has advanced to its greatest extent, the pressure at the ring may be as considerable, and the stricture nearly as complete, as when directly produced by the escape of a larger piece of omentum than the opening can contain.

Besides the immediate relief to be expected from the operation in the case now detailed, I had also in view, did the state of parts permit, to de-

* Vide Key's Lecture on Omental Hernia, in Medical Gazette, Vol. IV. p. 105.

tach the omentum from the sac and inguinal canal, and return it fairly into the abdomen. This plan was successfully adopted, and the patient completely freed from the return of those distressing attacks of vomiting, and spasmodic pains in the abdomen, to which he was, formerly, so liable. Although this procedure is not necessary for the removal of any immediate danger under which the patient may be placed, it will be found essential, in many cases, to his future comfort, and ought to be adopted, wherever it is practicable.

We are advised by Hey*, Scarpa†, Boyer‡, Richerand§, and other writers, not to separate the adhesions which the neck of an omental rupture may have contracted with the neighbouring parts, particularly when the disease is of long standing, but to cut off the prolapsed portion, and allow the rest to remain in the wound. Of these authors, some appear to be influenced by the fear of hemorrhage taking place into the abdomen, from the cut edge of the omentum, whilst others maintain, that the hernial aperture is in this way effectually plugged up, the return of the disease prevented, and a firm surface obtained for granu-

* Practical Observations in Surgery.

† Treatise on Hernia, by Wishart. Edin. 1814.

‡ Traité des Maladies Chirurg. Tome VIII.

§ Nosographie Chirurgic. Tome III. Troisième Edit. Paris, 1812.

lations. Sir A. Cooper, even, in his valuable work on hernia, speaks (at page 32) of returning the omentum into the abdomen, with its cut edge to the sac, so as to form a plug, and produce a closure of the opening.

By permitting the divided omentum to remain fixed to the neck of the sac, a temporary closure of the aperture will be effected, and the immediate descent of any portion of intestine or omentum for a time prevented. But, on the other hand, besides the danger of the intestines adhering to, or becoming entangled with, this fixed band of omentum, there is the risk of a second hernia forming at the same aperture. When the abdominal muscles are called into powerful action, the fixed omentum serves as an inclined plane along which the intestines glide, and by which the impetus will be more effectually directed to the old hernial aperture, than to any other part of the abdominal parietes; and, of course, the risk of a secondary tumour forming, be greatly increased*.

The baneful effects on the stomach, which in nine cases out of ten will be found to accompany the permanent adhesion of the omentum to the

* In omental herniæ, which have existed for years, a portion of gut not unfrequently escapes into the same sac, and becomes strangulated.

inferior hernial openings of the abdomen, are also entitled to our consideration. Sometimes the function of the stomach is only at times impaired, but in other cases this viscus has been dragged from its natural position, even below the middle of the abdomen, digestion destroyed, the most painful symptoms excited, and bad health ultimately induced. In addition to what has been already stated, I select the following cases out of many on record, to prove this fact.

M. Guerin* saw in the Hôpital de la Charité a man, upon whom the operation for strangulated hernia was performed, and a portion of gangrenous omentum removed, the healthy part being allowed to remain in the wound. The wound was healed in five weeks, but the patient continued to vomit after every meal. He was, at last, reduced to the necessity of eating in bed, with his legs drawn up to the abdomen, so as to relax the omentum, and prevent its dragging influence on the stomach.

M. de la Faye† opened the body of a woman, in 1740, who had been operated upon for hernia several years before. From this time functional derangement of the stomach took place, and she ceased to enjoy good health. The omentum was

* Mémoires de l'Académie Royale de Chirurgie. Tome III. p. 406.

† Ibid.

adhering to the inguinal ring, and the stomach, which was dragged almost perpendicularly, had lost its natural shape, and assumed the form of one of the large intestines.

Vesalius relates, in his work on anatomy, an instance of great and unnatural displacement of the stomach, from an irreducible epiplocele of from four to five pounds weight; and Dr. Robert Lowis, Physician, in Edinburgh*, met with a case somewhat similar in the year 1722. The patient was sixty-three years of age, and had been subject, from his youth, to an irreducible epiplocele, which gave rise to a variety of urgent symptoms. On dissection, the greater part of the omentum was found in the left side of the scrotum, and attached to the testicle; the stomach was attenuated, inflated, and greatly displaced: the pylorus lay obliquely downwards, as far as the right side of the umbilicus, and the œsophagus entered the stomach at an acute angle.

The necessity of returning the omentum into the abdomen whenever it is practicable, that it may regain that position in which its attachments to the stomach and colon would naturally place it, is, I think, sufficiently obvious. I must, therefore,

* Medical Essays and Observations, Vol. I. p. 231. 3d Ed. Edinburgh. 1747.

dissent from those authors who maintain, that the permanent adhesion of the omentum to a hernial sac is productive of little inconvenience, and that, at first, although the stomach and colon may have their functions interrupted, these parts soon become accustomed to this restraint, and cease to feel its influence. It happens, on the contrary, in many instances, that the symptoms instead of yielding become daily more distressing, and continue to harass the patient with increasing severity during the remainder of life.

Besides, we sometimes find, that the disorganization to which the irreducible omentum is liable, is not confined to the tumour, but extends into the abdomen. The abdominal portion of this membrane, is, from this cause, as well as from the stretching, pressure, and irritation, to which it is subjected, apt to become extensively and incurably diseased. I have seen one case, and a preparation of the diseased parts of another, in which the omentum within the abdomen, as well as the portions contained in the irreducible ruptures, had lost every vestige of its natural structure, become exceedingly bulky, indurated, and tuberose, and produced death by exciting ascites.

In the following case of irreducible epiplocele, the adhesions of the omentum were also destroy-

ed, and the urgent symptoms removed, although the parts were not in a state to promise very marked success.

In January 1823, a country labourer, 57 years of age, of a feeble constitution, waited upon me at the request of a surgeon in his neighbourhood, regarding an irreducible scrotal hernia of the right side. The tumour was about the size of the fist, of a pyriform shape, and was doughy and irregular. It first appeared twelve years ago, from violent exertion, and for three years after continued to protrude occasionally, but to be easily reduced. After this it began to increase in size, became irreducible, and has maintained its present magnitude for about six years. He is subject, especially after meals, or when the abdomen is much distended, to a dragging at the stomach, vomiting, and constipation. These symptoms give way occasionally, when he lies on the left side, with the body bent forward, and the thighs drawn up to the abdomen; at other times, they continue unrelieved for hours, and only subside after free alvine evacuations are procured.

I recommended the use of a suspensory bandage, which he continued to wear for two months with partial relief. At this time, in consequence of exertion in lifting a heavy weight, the neck of the tumour suddenly enlarged, followed by acute

pain in the part and belly, by nausea, and vomiting. These symptoms increased, with a quick, small pulse, anxious countenance, thirst, hiccup, and constipation. Blood-letting, the warm bath, purgatives, and the tobacco enema were employed without success, and about thirty hours from the commencement of this attack, I was requested by the surgeon in attendance to visit him. The symptoms of strangulation were then so urgent and well marked, as to induce me, after a moderate use of the taxis, to recommend the immediate performance of the operation. To this proposal the patient refused to submit; we therefore agreed to apply ice to the tumour.

It was impossible to ascertain, on carefully examining the neck of the hernia to which the additional tumefaction was confined, whether the recently protruded part upon which the urgent symptoms seemed to depend, was intestine or omentum. From the severity and obstinacy of the symptoms, it was supposed, that a portion of bowel had escaped, but in either case, the application of cold might be beneficial.

He experienced considerable relief in less than half an hour after the bladder containing pounded ice was applied, and at the end of an hour there was a good deal less tension and tenderness of the tumour and abdomen, the vomiting had ceased,

and the pulse become slower. It was agreed to continue the cold some time longer, while attempts should be made to open the bowels by the compound colocynth pill and enemata.

The attending surgeon was, unfortunately, prevented from seeing this patient again for nearly twelve hours, and during this time the ice was repeatedly renewed, and continued without interruption. When then visited, he expressed himself as quite well,—the pain of the tumour and abdomen was completely gone, and he had had several copious stools. The integuments covering the tumour were cold, hard, and of an ash grey colour, whilst the adjacent skin was yellowish and ecchymosed. Warm applications were very imprudently had recourse to on the removal of the ice, and, as might have been expected, accelerated, if they did not actually produce, the complete gangrene of the discoloured integuments which soon followed. The slough separated in nine days, when the hernial sac, testicle, and cord were freely exposed.

When I saw him again on the third day after the detachment of the slough, I found this extensive surface suppurating freely. The tumour, which was about the size of a large lemon, appeared to be inclosed in its sac, had all its external attachments destroyed, and was only fixed to the

inguinal ring by a pedicle, about the thickness of the finger. I divided this part with the knife close to the ring, having previously ascertained that there was no intestine included. Little pain was produced, and only a few drops of blood lost.

I was now anxious to secure, if possible, greater comfort to the patient, by having the omentum returned into the abdomen. The parts were so completely exposed, that I could with great ease examine the state of the ring. The adhesions were here pretty intimate, but so soft, from the previous suppuration, that I had no difficulty in destroying them with a probe, and pushing the omentum before the finger into the abdomen. Its texture was considerably softened, and I was afraid I might have injured it by the very gentle force applied with the finger, but if so, no bad consequences followed.

It was several weeks before the sore filled up and cicatrized, and his health suffered a good deal by confinement. By the application of a truss the return of the disease was prevented, and he now enjoys a share of health and bodily comfort, to which, for several years before, he was a stranger.

I have found the use of cold to an omental rupture by means of ice, snow, or evaporating lotions,

more successful in promoting reduction, than any other external application. If the omentum be engorged or inflamed, the cold constringes the vessels, and of course diminishes the disproportion between the tumefied mass, and the opening through which it has passed. This effect will be materially assisted, by the continued pressure kept up on the tumour by contraction of the scrotum and surrounding integuments.

Sir A. Cooper once succeeded in reducing an omental inguinal hernia which had been down for a fortnight, by applying ice for four days; and the same success has attended its employment by others. It is sometimes, however, carried to a dangerous extent, and gangrene produced. This is almost uniformly confined to the integuments; at least, I have not met with any case, in which the contents of the sac were involved in the mischief. In robust and healthy subjects, the application may be continued for days with impunity; but when the patient is old and debilitated, its continuance for a few hours may be sufficient to destroy the vitality of the parts. Its effects should be, therefore, carefully watched by the surgeon.

The old practice of including the divided omentum in a ligature, before returning it into the abdomen, is now happily exploded, and all that we require to do, is to secure the bleeding vessels in-

dividually, with fine ligatures. Sharp and Pott often returned the cut omentum without applying a ligature, and were never troubled with hemorrhage. When the excised portion which forms the hernia is small, and not materially changed in structure, little hemorrhage is to be expected; but when its volume is greatly increased, and morbidly altered, the vessels will be increased in the same proportion, and may require to be tied. I have seen one case, in which a smart bleeding followed the excision of a diseased piece of omentum, in an entero-epiplocele; and Hey * met with two cases, where, from his not having tied the bleeding vessels before the divided omentum was replaced in the abdomen, hemorrhage occurred, which nearly proved fatal.

Suppuration, although rather uncommon, sometimes takes place in the sac of an irreducible omental rupture. Le Dran mentions a case in which the pus entered the abdomen, spread along the omentum to the stomach, and proved fatal. In the following case, this diseased state was more circumscribed and the result more fortunate.

I was desired to visit J. J., labourer, aged 56, on the 13th June 1828. I found, that he had been confined to bed for three weeks in consequence of a large, pyriform, and painful tumour,

* Practical Observations, in Surgery, p. 188.

occupying the left groin. It extended from about half an inch above the external inguinal ring where it was nearly as thick as the wrist, to the bottom of the scrotum. The neck of the tumour which was painful on pressure, and where a distinct impetus was felt on coughing, had an irregular, doughy feel; as also the whole extent of the tumour posteriorly; while anteriorly it was tense and elastic. The integuments were much thickened, but not inflamed: he had slight pain on pressure for an inch or two above the left inguinal canal, with occasional flatulent pains in the belly, but without swelling or tension. His pulse was about 100, his tongue loaded, and he had occasional nausea, but without vomiting. Upon inquiry I found, that he had been subject to a reducible hernia in the left side, for many years. That about two years ago, a small portion could not be returned, but it gave him no uneasiness, nor did it prevent him from wearing a truss. About seven weeks ago, a large portion suddenly descended, which soon became painful, as he imagined, from being bruised. He continued at his employment for four weeks longer, when the increasing pain and swelling obliged him to desist. For the first ten days of his confinement the pain of the tumour was moderate, his bowels were with difficulty opened by purgatives, and he had repeated attacks of colic, with a painful sensation of dragging at the stomach. About eight

days ago, a surgeon was called in, and made repeated attempts to reduce the tumour, but unsuccessfully, and prescribed purgatives, leeches, and fomentations.

I was convinced, from the history of the case, and the characters of the tumour, that it was an omental rupture, with probably a considerable effusion of fluid into the sac. I did not think it possible, that any portion of bowel was included, as, from the tension and firmness of the tumour, it appeared impossible that the contents of the alimentary canal could have passed through it. The tumour was evidently in an inflamed state; but as this morbid action had not spread much, if at all, into the abdomen, and as the symptoms were mild, I did not think an operation warranted. I therefore put the patient on an antiphlogistic regimen, ordered leeches to the tumour, to be followed by cold evaporating lotions, purgatives, and an occasional anodyne.

There was little change of the symptoms till the evening of the 15th, when they began to increase. On the forenoon of the 16th he complained of acute pain, extending from the tumour to the umbilicus, and back, aggravated by pressure, coughing, and deep inspiration. He had vomited repeatedly during the night, had troublesome hiccup, an anxious countenance, a dry and thickly

furred tongue; with the pulse at 116. The shape of the tumour was unaltered, but it was larger, more tense, and fluctuated more distinctly than on the 13th.

I suggested to the patient the propriety of his submitting to an operation, to which he at once assented. I commenced, about three o'clock P. M., in the presence of Dr. Weir, and Mr. Stirling, by making an incision about two inches and a half in length, over the neck of the tumour. After dividing the integuments, fascia, and cremaster muscle, there still remained a thick, dense, covering, which was raised on the director, and cut, in five or six successive layers, before the sac was opened. Instead of serum escaping, as was expected, about eight ounces of thick pus flowed out. The posterior surface of the sac was covered, through its whole extent, by a hard irregular mass, which could be traced from the most depending part of the tumour, into the abdomen. This part had the plaited, ridgy appearance which diseased omentum frequently exhibits, and I had no hesitation in considering it to be a morbid portion of this membrane. There were, also, several bands of adhesion, apparently recent and easily torn, passing from the one side of the sac to the other, anterior to the omentum. One of these lay over, and closed, the external inguinal ring, and seemed to account for the fluid not escaping

into the abdomen, when the taxis was employed. It was easily torn by the finger, which then passed through the inguinal canal into the abdomen. From the open state of this canal it was evident, that inflammation, and not strangulation, was the cause of all the symptoms and of the morbid appearances.

As the patient had vomited severely during the operation; as he was greatly exhausted, cold, and death like; with a feeble pulse; and as the adhesions of the omentum to the ring, sac, and testicles were intimate and extensive, I was deterred from making any attempt to remove the diseased parts. The upper half of the wound was closed by a suture, and adhesive plaister, while the depending part was left open for the escape of matter.

In a few days, all the unfavourable symptoms disappeared, and he complained only of the copious discharge from the wound, and of occasional attacks of colic, especially on taking purgatives. In about three weeks, the portion of omentum occupying the inferior part of the sac, was found considerably detached, had a florid, granulating appearance, and projected between the edges of the wound: this I removed with the knife, but could not separate the remainder. The wound was healed, and the patient able to walk out, about

the end of July. During the two subsequent months he was often confined by spasmodic pains in the abdomen, and vomiting, but since that time, I have had no means of ascertaining, whether or not these attacks have ceased to annoy him.

Had the operation not been performed in this case, a fatal result might have been ultimately expected, from the purulent matter finding its way into the cavity of the abdomen; its escape externally being prevented by the thickened and condensed state of the integuments covering the tumour. It shows, also, that a large portion of omentum may be exposed in an open, suppurating wound, and subjected to irritation for weeks, with impunity. Nevertheless, we should do well to recollect, that although great liberty may be used, in dividing the preternatural adhesions between the omentum and sac, and in excising such parts of it as may be diseased, yet in bad habits, a very trifling injury inflicted upon it, may prove fatal. (See page 286.)

In May, 1827, I was requested by a surgeon in town, to visit a woman who three days before, had been tapped at the umbilicus for ascites. She had had for several years at this part a small reducible hernia of a spherical shape. As the integuments were thin, and the tumour transparent when viewed with a candle, it was determined to evacuate

the fluid from the abdomen by puncturing the sac. This was done with great ease, and without pain to the patient, and a bandage carefully applied. She had been, for several months, in bad health, was much emaciated, had a cachectic appearance, and laboured under a tuberculated enlargement of the liver.

About eight hours after the operation, she began to complain of nausea, slight uneasiness in the region of the stomach, and tendency to syncope. In a few hours vomiting commenced, and continued with little interruption; and the bowels were only once imperfectly moved, although purgatives and enemata were freely employed. The pulse was small, weak, and indistinct, the extremities cold, the tongue white, and dry, the thirst urgent; and when I saw her, there was an unusual appearance of collapse, without any marked indication of acute disease. The pain, which was only occasional, trifling, and not increased by pressure, was confined to the umbilical and epigastric regions; where there also existed a little flatulent distension of the belly; but without tension or hardness. Before death, which took place on the sixth day, hiccup became one of the most troublesome symptoms; and she was occasionally delirious.

On dissection, the omentum about an inch and

a half from its inferior margin, was fixed by old adhesions, to the upper edge of the umbilical opening, or neck of the sac. On examining the loose portion, which had probably formed the contents of the hernia, before the commencement of ascites, it was found of a dark, red colour, and it contained a small triangular opening, which corresponded, in size and shape, to the trocar that was employed. The rest of the omentum till within half an inch of the stomach was livid, and gangrenous. There were, a few patches of inflammation on the intestines, which the omentum covered, but in no other situation, and there was an effusion of ten ounces of moss coloured fluid into the abdomen.

The nature of the disease was, in this case, clearly ascertained on dissection; but during life, the symptoms were so obscure, as to render it impossible to establish a diagnosis. They were more characteristic of that collapse and exhaustion, which sometimes follow paracentesis abdominis, in worn out and debilitated subjects, than of acute inflammation. The vomiting and hiccup were the only prominent symptoms, and these might have depended on very different causes.

We find attempts made, by some of the older nosologists, to point out the prominent and distinctive symptoms of idiopathic inflammation of

the omentum, so as to establish the means of distinguishing this disease, from peritonitis, or enteritis. Sauvage gives the following definition: "Epiploitis cognoscitur ex febre inflammatoria, cum dolore, acuto lancinante, per superiorem, et mediam abdominis regionem, infra tegumenta, in ipso abdominis cavo;" while Vögel, who applies to the disease the term "Omentitis", affixes to it the following symptoms: "Omenti inflammatio, febris continua, cum dolore, et tumore, in regione epigastrica, et hypogastrica."

We shall seldom, however, succeed in distinguishing the disease during life. The symptoms may be so obscure, and ill defined, as not to indicate the seat of the disease, or they may resemble so much, those of peritonitis, as to render a diagnosis exceedingly difficult. It is only when the inflammation commences in an omental rupture, and extends to the abdominal portion of this membrane, that we can correctly ascertain its seat, and existence.

The injury inflicted by the trocar in the above case, was merely accidental, and might have happened in the hands of the most expert and cautious surgeon. The old hernial sac contained, at the time, not its usual contents, but only a portion of the abdominal fluid; and there were no means of ascertaining, that the omentum was adhering to

its neck, and within reach of the instrument. I have repeatedly evacuated the fluid of ascites, by puncturing the sac of an old umbilical hernia, not only with safety, but with greater facility, and less inconvenience and pain to the patient, than if the usual situation had been selected. The practice is sanctioned by Sir A. Cooper, and may be employed in any case where the sac is filled with the fluid of the abdomen, and not its usual contents.

An omental rupture is liable to be mistaken for a variety of diseases. When an intestinal hernia contains solid fæces, it presents some of the most prominent characters of an epiplocele. The history of the disease will, however, enable us to arrive at a correct conclusion.

Hydrocele of the spermatic cord, varicocele, &c. have also some resemblance to an inguinal epiplocele. It has likewise been mistaken for a common hydrocele. M. Lamorier, of Mont-Pellier*, found, on making an incision for the radical cure of a hydrocele, that he was mistaken as to the complaint, and that the tumour was an omental rupture, loaded with hydatids. The diseased part, which weighed four ounces and two drachms, was removed, and the patient recovered.

* Mém. de l'Academie Royale de Chirurg. Tome III. p. 404.

Adipose tumours are sometimes attached to the sheath of the spermatic cord, immediately exterior to the inguinal ring; but more frequently, they are formed within the abdomen, in the cellular texture which connects the peritoneum to the neighbouring parts, and are protruded through the ring. They thus occupy the position, and possess all the external characters of an inguinal epiplocele; and often render a diagnosis impracticable.

When small in size, they can be reduced with facility, and prevented from again escaping, by the application of a truss; but when large, or indurated, they continue irreducible, and it is in this state they are likely to engage the attention, and baffle the skill and tact of the surgeon. Pelletan relates, in his "Clinique Chirurgicale,"* several curious cases of such tumours.

In nearly all the recorded cases, where the adipose tumour originated within the abdomen, the peritoneum was pushed before it, so as to form a sac analogous to a hernia. But, in the only case of this kind, which I have had an opportunity of examining, the tumour was found to have originated in the cellular texture exterior to the peritoneum, close to the outer edge of the internal

* Tome III. p. 33, &c. Paris 1810.

inguinal ring, and to have descended along the cord, and formed, externally, a large pyriform tumour, without being invested by a peritoneal sac. This tumour, which was irreducible, was supposed to be an epiplocele, although not accompanied by any of the symptoms usually attendant on this disease. This opinion was confirmed by the existence, at the same place, of an intestinal hernia, which could be easily reduced, and retained within the abdomen.

After death, which was occasioned by pneumonia, the peritoneum was found dragged through the inguinal canal, by the descent and weight of the tumour, so as to form a sac, into which the intestine passed. The appearance of the tumour, when exposed by dissection, and its texture, when divided, so closely resembled the adipo-fibrous degeneration to which the omentum is occasionally subject, as to render it impossible to distinguish between them.

The nature of the disease was only correctly ascertained, by finding that the tumour was exterior to the hernial sac, and that the omentum was unconnected with the tumour, and occupying the upper part of the abdomen.

Glasgow, 22nd Nov., 1830.

*APPENDIX**.

Glasgow, 29th December, 1830.

DEAR SIR,

Since I sent you the Essay on Omental Hernia, J. J., the patient upon whom I operated for inflamed scrotal epiplocele, on the *left side,* on the 16th June, 1828, and whose case is detailed at page 274, was admitted into the Royal Infirmary of this city, with a similar disease on the *right side.* As the history of this case is interesting, and of considerable practical importance, I have deemed it proper to forward to you the following statement, as an Appendix to my paper. I saw the patient twice while in the Infirmary, was present at the consultation, the operation, and post mortem inspection; and have since carefully examined the preparation of the diseased parts, which is preserved in the Museum of the Portland Street Medical School. The patient was under the care of Dr. M. Buchanan, one of the attending surgeons, who has kindly favoured me with the necessary details of the case, of which the following is an abridgment.

J. J., aged 58, admitted 2d Dec. 1830. Occupying the right inguinal region, and extending to the bottom of the scrotum, is a firm, doughy, in-

* Vide page 279.

elastic tumour, of the thickness of the wrist, and of a slightly pyriform shape. The integuments covering it are of a dull red colour, and the size of the tumour is not increased by coughing, or by the erect position. There is slight tenderness of the abdomen around the root of the tumour, especially on pressure, but there is no unusual swelling or tension. Bowels are said to have been opened by medicine the night previous to admission. No vomiting; pulse 86, full; tongue clean; general health much impaired.

About two years ago the tumour in the right groin was observed for the first time, and was easily reduced, in a recumbent position; but no truss was applied. Four weeks ago it became irreducible, gave rise to painful feelings in the abdomen, which have greatly increased during the last eight days. Has continued since the previous operation to wear the truss over the left inguinal opening, which is much dilated, and through which an intestinal rupture occasionally protrudes; but not the slightest remains of an omental tumour can be discovered, in this situation.

The taxis was immediately employed, and, apparently, a small portion of the tumour returned, which seemed to afford a little relief. *A dose of castor oil, an enema, cold to the tumour, and fomentations to the abdomen were prescribed.*

From the period of the patient's admission up to mid-day of the 5th of Dec., when the operation was decided on, in consultation, every bad symptom as it arose was judiciously met by appropriate remedies, and it was accordingly performed by Dr. Buchanan a few hours after stercoratious vomiting had set in*.

An incision two inches and a half in length was made over the neck of the tumour, and when the sac was laid open two ounces of pus escaped. The tumour was wholly composed of omentum, which was engorged, livid, consolidated into a firm mass, and in some points, of a pulpy texture. It adhered so intimately to the sac, as to render its detachment by the finger, or scalpel, altogether impracticable. A portion, about the size of a pigeon's egg, at the inferior part of the sac, gave way under the finger, and was removed. Several firm bands of adhesion were discovered, crossing in various directions, and apparently, compressing the neck of the tumour. When these had been cautiously divided by the bistoury, sero-purulent fluid was pressed into the sac from the abdomen. It did not appear necessary, or even practicable, to enlarge the ring, the adhesions of the omentum to this part being so firm and intimate. The

* The Council of the Society have deemed it proper to abridge the daily reports of this case both here and after the operation, because of their practical inutility in a work like this.

edges of the wound were approximated by a suture and adhesive plaister, and a bandage applied.

Nine o'Clock, P.M. No vomiting since the operation, hiccup and pain of abdomen considerably diminished. Still some flatulent distention about the umbilicus. Pulse 108, sharp; no stool. *Bled to twelve ounces; poultice to wound.* To have *extract hyosciam. ten grains, carb. ammon. six grains, and an enema in the morning.* Has had four copious stools.

6th. Although he has slept a good deal and passed a comfortable night after the operation from the medicine administered, every bad symptom with stercoratious vomiting came on before twenty-four hours had elapsed; and notwithstanding every judicious effort that skill, kindness, and indefatigable attention, could accomplish, he died on the seventh, just forty-eight hours after the operation.

Inspection. On laying open the abdomen, about twelve ounces of sero-purulent fluid were found in its cavity. Very slight traces of peritoneal inflammation were discovered. The omentum was collected into a large, irregular, thickened, dark coloured, mass; and almost wholly contained in the right hernial sac. On several points of its surface ulceration was detected, and pus deposited,

and the portion contained in the sac was partly gangrenous. The colon, which adhered intimately to the mass of omentum, was dragged from its natural situation, and firmly fixed across, and nearly in contact with, the internal orifice of the inguinal canal. The gut did not adhere to the parietes of the abdomen, or to the ring, but was so fixed down, to the displaced and diseased omentum, as to appear, when first examined, to have its calibre considerably diminished. When, however, the diseased parts were removed, this apparent obstruction disappeared.

The hernial sac, on the *left* side, was of considerable size, and much thickened; and the inguinal ring greatly dilated. There was no part of the omentum attached to it.

If the details which I have already given of the epiplocele on the *left* side be contrasted, with those which accompanied this disease on the *right*, it is evident, that there was great similarity in the size, and other external characters of the two tumours, and that great resemblance also existed in the progress of the symptoms. During the former attack, the disease advanced more slowly, the local and general symptoms were less urgent, the abdominal inflammation was less extensive, and the suppuration in the sac more complete. The patient was therefore in a more favourable

state for the operation; but, even in the second attack, although our hopes of success were much less sanguine, still, the increasing urgency of the symptoms; the fact of the inflammation having commenced in the tumour, and extended to the abdomen; the total failure of antiphlogistic treatment, both local and general; the probability, that part of the urgent symptoms might depend on a portion of omentum having recently escaped, and become strangulated, or upon a knuckle of intestine being included; and the marked success of the operation on the left side, two years and a half ago, induced the majority of the gentlemen present at the consultation, to recommend this step, as the only remaining expedient, which either medicine or surgery afforded. Had the abdominal inflammation not been so extensive, the result might have been more fortunate. The operation did not however aggravate the symptoms, but on the contrary they were, for a short time, so much relieved, as to induce faint hopes of his recovery. The unnatural position of the colon might also have been remedied by the operation, had the state of parts been such, as to have admitted of the adhesions to the ring being destroyed. This however was impossible, and from the state of the patient, and the extent and intimacy of the adhesions, no alternative remained, but to allow the omentum to continue in the wound, and to remove

from it every source of stricture or undue pressure.

I expected to find on dissection, that a portion of omentum was also fixed to the *left* inguinal ring. The absence of this circumstance can only be accounted for, on the supposition, that the suppuration in the sac which detached the great bulk of the irreducible omentum, and enabled me to remove it by the knife, three weeks after the first operation; had in the same way, during the healing of the wound, destroyed the attachments of the omentum to the ring, and allowed it to return into the abdomen; its re-appearance at this opening being afterwards prevented by the constant application of a truss.

To A. Copland Hutchison, Esq., &c. &c.

SOME CONSIDERATIONS

WITH RESPECT

TO

THE BLOOD,

FOUNDED ON ONE OR TWO VERY SIMPLE EXPERIMENTS ON THAT FLUID.

BY BENJAMIN G. BABINGTON, M.D. F.R.S.

Read Jan. 25, 1830.

EXPERIMENT I.

LET blood be drawn in a full stream from the vein of a person labouring under acute rheumatism into a glass vessel which should be filled to the brim. By close inspection a colourless fluid will be immediately perceived around the edge of the surface, and after a rest of four or five minutes, a bluish appearance will be observed forming an upper layer on the blood, which is owing to the subsidence of the red particles to a certain distance below the surface, and the consequent existence of a clear liquor between the plane of the red particles and the eye. Let now a spoon previously moistened with water, be carefully immersed into the upper layer of liquid by a gentle depression of one border. The liquid may thus be collected

quite free from red particles, and will be found to be an opalescent and somewhat viscid solution perfectly homogeneous in appearance. By repeating the immersion we may collect this fluid in quantity and transfer it to another vessel. That which I employed, is a bottle holding about 180 grains, of globular form, with a narrow neck and perforated glass stopper.

Hewson went so far as to gather a small portion of this upper layer into a teaspoon, and as he found it after an interval to coagulate into a jelly, he concluded it to be coagulable lymph, and hence, in reasoning on the buffed coat of blood, thought the fibrine became specifically lighter than usual. Dr. Scudamore evidently has the same idea, when he states that liquid fibrine is lighter than serum. Hey thought that in buffed blood the different constituents were more intimately mixed together than in other cases, thus evincing his opinion of their separate existence; and Dr. Bostock in discussing the question whether the specific gravity of fibrine is increased by coagulation, evidently considers it as certain that pure fibrine exists in two states. We are led to the same conclusion with regard to his opinion when he speaks of fibrine as being "added to the blood particle by particle, so that while this fluid is in agitation in the vessels, it has no opportunity of coalescing or concreting."

The sequel of the experiment just described clears up the errors on this point. The solution with which the globular bottle is filled though quite homogeneous at the time it is thus collected, is found after a time to separate into two parts, namely, a clot of fibrine which has the precise form of the bottle in which it was gathered, and a clear serum possessing all the usual characters of that fluid.

Hewson, who has led the way to the ascertainment of these facts, missed the right conclusion respecting them, by collecting so small a quantity of the fluid in question, and in so shallow a vessel that no separation was visible. It is, however, certain from the foregoing experiment, that buffed blood consists of only two constituents, namely, the red particles, and a liquid which I shall call Liquor Sanguinis.

It had long been remarked, that what is usually called inflamed blood, coagulated slower than healthy blood, and that the last portions of blood drawn from an animal which was bleeding to death coagulated quickest. The immediate cause of a buffy crust appears therefore to be as follows. The blood consisting of Liquor Sanguinis and insoluble red particles, preserves its fluidity long enough to permit the red particles, which are of greater specific gravity, to subside through it. At

length the Liquor Sanguinis separates, by a general coagulation and contraction, into two parts, and this phenomenon takes place uniformly throughout the liquor. That part of it through which the red particles had time to fall, furnishes a pure fibrine or buffed crust, while that portion into which the red particles had descended, furnishes the coloured clot. This, in extreme cases, may be very loose at the bottom, from the great number of red particles collected there, each of which has supplanted its bulk of fibrine, and consequently diminished its firmness in that part. There is, however, with this limitation, no more fibrine in one part of the blood than another *.

* From the foregoing account of the cause of a buffed surface on blood, it will be easily perceived why the form of the vessel in which it is received influences this phenomenon—a matter of common observation. The space left by the gravitation of the red particles, bears a proportion to the whole perpendicular depth of the blood, so that in shallow vessels scarcely any buffed coat may appear where the same blood in a deep vessel would have furnished such a coat of considerable thickness. It is a fact, however, which I have not seen noticed, that the quantity of crassamentum is also dependent, within certain limits, on the form of the vessel employed. If this be shallow, the crassamentum will be abundant, if approaching in form the cube or sphere, it will be scanty. This difference is owing to the greater or less distance of the coagulating particles of fibrine from a common centre, which causes a more or less powerful adhesion and contraction of those particles. Perhaps few facts relating to the phenomena of venesection, are of more practical importance than this; since blood is said to be thick or thin, rich or poor, in reference to the quantity of crassamen-

It may be objected to a general conclusion drawn from the above experiment, that it is made upon blood in a diseased state. To obviate this objection, I have sought a means of placing healthy blood under such conditions as should enable its red particles to settle more quickly than would otherwise be the case.

tum it contains, and views of a disease are founded on these supposed conditions, which after all depend, not on the blood itself, but on the vessel into which it is received.

In the following examples the blood of one and the same venesection was received partly into a specific gravity bottle of a pear shape, and partly into a common pint basin. It was suffered to run into the one and the other vessel for several alternations, till both were charged to the extent required, thus obviating the possibility of difference in quality. After a day's rest, the vessels with their contents were weighed; the serum was then decanted from the clot, which with the vessels were again weighed; lastly the respective clots were removed, and the empty vessels were weighed. This simple method determined the weight of serum and clot in both cases.

Example I. An elderly man labouring under Purpura being bled, his blood at 87 Fah. had a specific gravity, 1050. Its serum at 65, 1027 of a deep yellow colour. The crassamentum was not cupped but was covered with a gelatinous translucent buff. Some of this blood being received into the pear shaped bottle, the proportion of serum to crassamentum was as 1000 to 1495; another portion being caught in a pint basin, its serum was to its crassamentum as 1000 to 2230.

Example II. A female aged twenty-four was bled for vertigo while pregnant. Her blood at 60 had a specific gravity 1049. Its serum at the same temperature 1028. The crassamentum was florid; neither firm nor buffed. Part of her blood being received into the pear shaped bottle, its serum was to its

EXPERIMENT II.

Take two similar tall glass jars or phials, each capable of holding about four or five ounces, and let one of them be half filled with olive oil; draw the blood of a healthy subject into each. That which flows through the oil will be found to have

crassamentum as 1000 to 945, another part being received into the pint basin, its serum was to its crassamentum as 1000 to 1716.

Case III. A middle aged man with Phthisis; pulse 120, hard; specific gravity of blood at 87, 1044; serum at 60, 1028; clot firm, with a bluish white, but not very thick buff. Serum to clot, in the bottle, 1000 to 960, in the basin, 1000 to 1090.

Case IV. A female aged 35, labouring under Diabetes mellitus; specific gravity of blood, at 90, 1048; specific gravity of crassamentum, 1079; of serum at 60, 1024.6, as opaque, and nearly as white as milk. The clot was covered with a remarkably firm white crust, so tough, that when drawn over the mouth of a tumbler, after being freed from the red subjacent part, it dried into a membrane as thick as an ox's bladder. The remainder of the clot was very loose, and on being stirred about, became diffluent. Serum to clot in the pear-shaped bottle, as 1000 to 1292, in the basin, as 1000 to 1717.

I shall not, of course, be understood to affirm that in these cases the actual quantity of fibrine varied according to the vessel in which the blood was received. The difference is sufficiently explained, by supposing that the clot in the bottle is more compact and less spongy, and consequently contains a smaller proportion of serum in its insterstices than that formed in the basin.

a layer of Liquor Sanguinis on its surface, which will form a buffed crust, while there will be none upon that which is received in equal quantity, and in other respects under the same circumstances into the empty jar. This experiment will not always succeed, for blood sometimes coagulates so quickly, even though it pass through oil, that no buffed crust is formed. It is enough, however, for my purpose, that there is frequently a very evident difference. If this experiment be performed on blood disposed to exhibit a buffy crust, that which is formed under the oil will be twice or thrice as thick as that formed in the empty jar. The reason that blood is buffed when drawn into oil we need not now consider. It is, indeed, sufficiently evident.

Healthy blood then is similarly constituted as blood disposed to form a buffed crust, the only difference being that the former coagulates more quickly than the latter.

From experiment the first, we may deduce in another manner that the Liquor Sanguinis is a uniform homogeneous fluid, and no mere mixture of fibrine and serum. The globular bottle with its perforated stopper, when perfectly filled with the liquor, exhibits on the separation of this fluid a clot which is precisely of the same shape (even including the indentation in the bottom,) as the

vessel in which it has formed *. Hence, we may conclude, that coagulation took place uniformly from every part of the fluid, and the uniform density of the clot confirms this conclusion. Had the particles of the fibrine been in the least degree lighter than those of the serum, as supposed by Dr. Scudamore, the lower part of the clot would necessarily have been defective in form and density; so also, had the fibrine been heavier, the upper portion would have been similarly defective. Another circumstance which I have ascertained by means of the globular bottle is, that no change takes place in the sum of the densities of the constituents of the Liquor Sanguinis by their separation, but that what the fibrine gains in specific weight is exactly balanced by what is lost by the serum. This is proved by the fact, that the bottle being exactly filled with Liquor Sanguinis at a given temperature remains full, notwithstanding the subsequent coagulation, as long as that temperature is maintained: whence it may be regarded as improbable that any free caloric is given out during the process of coagulation, since what the fibrine loses in capacity for heat by condensation, will in all likelihood be gained by the albuminous fluid. It is already known that albumen does not alter its volume on coagulation by heat; but I am not aware that this point has been hitherto investi-

* The clot of blood drawn into any mould, however varied in shape, takes its form with great exactness.

gated with regard to the spontaneous coagulation which takes place in Liquor Sanguinis, or blood.

From the above experiments I am led to believe that fibrine and serum do not exist as such in circulating blood, but that the Liquor Sanguinis when removed from the circulation, and no longer under the influence of the laws of life, has then, and not till then, the property of separating into fibrine and serum. This separation which may be considered a death of the blood, may, under disease, take place within the body, but never, as I think, consistently with healthy action.

It follows from the view here taken of the constitution of the blood, that there is no such animal fluid in existence as coagulable lymph. The Liquor Sanguinis cannot with propriety be so considered, for it is essentially a fluid, and if under certain circumstances it separates into two parts, only one of these (fibrine) is coagulable, nor can I admit that this one part, considered by itself, previously existed in a fluid state, for in order to its fluidity it was necessary that the two constituents should be so united as to form one compound. There is, therefore, no better reason for affirming, that fibrine exists in a fluid state in Liquor Sanguinis, than for affirming that muriatic acid exists in a solid state in muriate of ammonia. The salt, indeed, is solid of which muriatic acid

forms one ingredient, but the ammonia is essential to the solidity of the compound. In like manner, the compound is fluid of which fibrine forms one ingredient, but the serum is essential to its fluidity.

Nor is it an unimportant error to suppose a fluid secreted from the blood which has the property of becoming converted into a solid, for we are thus led to overlook altogether the fluid portion of the compound with the albumen contained in it, which always forms by far the greater portion of the secretion.

The fact that healthy circulating blood consists of a homogeneous liquor and red particles, leads to another of much importance, which I believe will be found true in most cases, namely, that when an effusion of serum takes place, we shall generally, in some neighbouring part, find a corresponding deposition of fibrine. We are told, indeed, that serum is a secretion intended for the lubrication of closed membranes, as those of the ventricles of the brain, of the pericardium, of the peritoneum, &c. but this I venture to think is as erroneous a notion as that which supposes the existence of coagulable lymph. The fallacy is founded on appearances observed after death, which do not exist during life. When we recollect how quickly the separation of Liquor Sanguinis into serum and fibrine takes place out of the body, we

ought not to be surprised to find, though it be but a few minutes after death, or even before it, if dissolution be gradual, a serous effusion into cavities which, during health, could not be destined to contain any fluid.

I doubt the fact, however, that such membranes have the power during health of secreting serum, by which term I mean a fluid essentially containing albumen; or that any thing more passes from them than an aqueous halitus, or vapour; and I therefore doubt the propriety of giving them the denomination of *serous* membranes. Under morbid defect of vitality they may and do suffer serum to exude from them containing more or less albumen, and in such cases we shall usually find effused into some neighbouring part the corresponding fibrine, which with the serum in question went to form the Liquor Sanguinis. Such membranes may pour forth the Liquor Sanguinis itself, in which case we shall find the separation to have taken place in the cavities which they line. Gelatinous masses will gravitate to their lowest parts, or flakes, or shreds of fibrine will be diffused through the fluid.

Wherever this gelatinous formation exists, it is owing to the presence of fibrine, since, as is well known, albumen never assumes a gelatinous form, under the ordinary temperature. We may indeed

with albumen, when mixed with water and heated, exactly imitate this appearance of fibrine, and form substances of all degrees of gelatinous consistence; but this only serves to confirm the belief that fibrine, in a diluted state, may put on a gelatinous appearance on coagulation. I have stated that closed membranes may pour forth serum or Liquor Sanguinis. They may also, under high excitement, pour forth blood itself. There is, therefore, no better reason for calling such membranes serous, than for calling them fibrinous or sanguineous membranes. The secretion of each is morbid, and we ought not to designate parts from the morbid actions which may be set up in them.

The examination of fluids effused into closed cavities from diseased action, throws much light upon this subject. The fluid found in the ventricles of the brain in cases of hydrocephalus, usually contains so little albumen, that it does not coagulate on the application of heat. I have examined some specimens, the specific gravity of which scarcely exceeded that of distilled water. It generally varies from 1005 to 1010; I have found it as low as 1000.5; and only in one instance of acute inflammation of the brain, did it amount to 1019. Now I have invariably observed, that where the specific gravity is low, and there is consequently but little albumen contained in the fluid, little or

no gelatinous effusion will be found under the pia mater. Where, on the contrary, the specific gravity is high, the gelatinous effusion is very abundant, particularly at the basis of the brain*, and other marks of fibrinous deposition are visible.

In effusions into the chest, the specific gravity of the fluid is generally much higher than that of the ventricles of the brain, varying from 1019 to 1024.

From this circumstance I should *à priori* infer that a more abundant effusion of fibrine would be found somewhere to correspond with the albumen thus indicated. The result proves the accuracy of this inference. A thick false membrane, composed exclusively of fibrine, often lines the pleura. Fluid from the chest is sometimes clear, but oftener loaded with fibrine, sometimes suspended in flakes, sometimes in particles so fine, as to give it the appearance of cream; after a few hours' rest these particles subside, and the clear serum in which they were suspended appears above. The fluid in this state may be justly called pus, which I believe to

* I am aware that a gelatinous appearance in the membranes of the brain, is sometimes owing to a mere infiltration of serum among the meshes of the cellular tissue, but I have reference above to such a deposition of gelatinous substance as remains consistent after repeated perforation with a point or division with the blades of scissors.

be no other than serum, in which minute particles of coagulated fibrine are suspended*. I have known such a secretion poured forth daily from the pleura, for more than a year together, preserving all along the same character and specific gravity.

What the circumstances are which determine the mode of separation of the fibrine from the serum, so that at one time it should form a false membrane adhering to the true membrane whence it exudes, at another, it should continue suspended in the serum itself, remains for future investigation. I shall, presently, offer some further remarks on this subject.

That such false membranes are formed of fibrine, resembling in every respect the buffed coat of blood, is very distinctly and beautifully shewn by drying portions of each, whilst stretched across the mouth of a small aperture, like the head of a drum. Not only will the identity of false membrane with the buffed crust of blood be thus demonstrated, but also the resemblance of both to true membrane be rendered apparent.

* This belief is negatively confirmed by the microscopical observations of Dr. Hodgkin, who says, in his paper on this subject, "as far as we have yet examined this secretion, its particles appear to be as irregular in size and figure as those of the brain, and bear no resemblance to those of the blood."

In ascites the effused fluid generally has a specific gravity of from 1014 to 1026, and in proportion as it is charged with albumen, may we expect to find fibrine either diffused through it in gelatinous masses, flakes, or shreds; or otherwise forming the fibrinous base of some preternatural growth, or false membrane lining the peritoneum. In peritonitis this last appearance is more especially evident.

In anasarca the gelatinous appearance of the cellular membrane from interstitial deposition is familiar to all; an appearance which as I have already observed, cannot depend on the presence of albumen. A section of the scrotum in those who have died under this state of disease, exhibits, very plainly, a gelatinous deposition of this kind. It will thus be perceived, that the part will not collapse, as it necessarily would, if the cellular membrane were merely infiltrated with serum, since the fluid form of this infiltration, and the ready communication of the interstices which contained it, would at once admit of its exit.

In the application of a blister we are furnished with another apt opportunity of witnessing the phænomena, which I conceive usually occur. The cutaneous vessels are excited; Liquor Sanguinis exudes from them, and separates the cuticle; serum is effused. Some fibrine is found in the most

depending parts of the vesicles, while the principal part is deposited on the surface, and in a short time is condensed again to form a new cuticle.

The vital conditions on which the nature of the effusion of blood or its constituents depends, the present state of our knowledge does not enable us to determine. On the physical conditions, however, we may be permitted to offer some remarks. These respect the containing vessels, and the contained fluid. All that seems necessary on the part of the vessels in order to the production of an effusion, is an opening of their pores, so as to admit of a transudation; and it is clear, that solid particles of appreciable size would require larger apertures for their transudation than homogeneous fluid, and that a less patulous state would suffice for the passage of vapour. These three degrees would be marked by vaporous effusion, liquid effusion, and effusion of blood with its red particles, and all these effusions may, I think, actually occur. The production of pure water would be the result of the first degree. I have already said that this sometimes occurs in the ventricles of the brain, and it also probably takes place in other closed cavities, perhaps, even in a state of health. This water may, I conceive, be separated by exhalation in the form of vapour. There is no other method by which water can be separated from a solution, but by distillation. The only cause of the formation of

vapour, at least the only one which can act in the body, is heat; an increased degree of heat, would, certainly, out of the body, produce an increased formation of vapour from any solution, and probably does so within its cavities. This vapour may find its way through pores which would not admit the transudation of any less subtle agent. We can, therefore, conceive a case of dropsy in which water might be accumulated without the transudation of any liquid whatever; being the consequence of only such a degree of expansion of the vessels as should admit the passage of vapour, and such a degree of local determination as should produce a preternatural local heat. Such a dropsy we should expect to find of chronic character; since the formation of fluid by distillation at a temperature so low, and where the temperature of the cavity which acts the part of a receiver, must be so very little below that of the fluid from whence the vapour rises, must necessarily be a work of time. It appears to me possible, that in those cases of hydrocephalus where the specific gravity of the fluid scarcely exceeds that of distilled water, such may be the process by which the fluid is formed. I must not be understood to affirm it as a fact proved, that exhalation is one mode by which effusion is effected, but only to offer it as affording a possible explanation of those cases where nearly pure water is found. The fact that there is no serous effusion in these

cases, taking the word serum to mean a fluid essentially containing albumen, I have not seen noticed; and yet nothing is to me more certain, than that death may be caused by a pure hydrocephalus, where there is no serous effusion, an assertion which would seem paradoxical, unless coupled with the explanation here offered.

Where there takes place an effusion of liquid, as contradistinguished from the supposed case of an exhalation of vapour, this may either consist of the Liquor Sanguinis, or of albuminous fluid. If of the latter, it either supposes a separation of the Liquor Sanguinis into fibrine and serum within the vessels previous to the effusion, which is probably of rare occurrence, or a secretion of serum, which we shall presently consider; but if the effusion be of Liquor Sanguinis, then it will vary in its character according to the degree of tenacity with which this liquor maintains its fluidity.

We may conceive a separation at the instant of effusion, and in consequence, an immediate formation of a minute, yet separate portion of fibrine and of serum, thus forming a liquid identical with pus. We may conceive on the other hand, that, previous to coagulation, time shall be allowed for the union of such transuded globules of Liquor Sanguinis in a fluid form, and according to the circumstances and locality under which this is ef-

fused, that we may find gelatinous or fibrinous deposition or false membrane. Its subdivisions by the meshes of the cellular tissue and its union by effusion with previously organized structures, would also be additional causes of diversity in its characters, and if we go further, and suppose that after effusion and separation either its liquid or its solid portion is again taken up by the absorbents, we shall have yet another source of diversity in the product which will be found.

It may at first view seem at variance with our experience, that any deposition of fibrine should exist even in some of the most familiar instances of serous effusion. The surgeon immediately directs his mind to a hydrocele, and asks where is the evidence of deposition? I have certainly not had an opportunity of verifying my notion in this complaint, but it will diminish incredulity if I here state in what proportion we are to expect to find fibrine, or how much we are called upon to account for. I may state as a general average* of the proportion of solid albumen in blood 6·00 out of 100·, and of fibrine 0·270. Now the average specific gravity of healthy serum is 1029, and when, therefore, an effusion amounts to this

* This average is deduced from seventy-eight cases given by M. Denis, in which the blood seems to have been very carefully analysed; see Recherches Experimentales sur le Sang Humain, considéré à l'Etat Sain, par P. S. Denis, 1830.

strength, we may conclude that the quantity of fibrine deposited should be 0·27 part out of 100. Applying this law to the cases of hydrocele, let us suppose eight ounces of serum to be drawn off of specific gravity 1029. We ought then to find fibrine deposited either in flakes at the bottom of the cavity, or as false membrane lining its walls, or in the form of interstitial jelly diffused through the meshes of cellular tissue, as follows, eight ounces = 3840 grains; every 100 grains of which furnish 0·27 of a grain of fibrine, so that the total deposition will amount to 10·36 grains. But we are putting the most extreme case, in supposing the specific gravity of the fluid to be 1029. It will, probably, much oftener be found of specific gravity 1015, or even lower than this. The quantity of albumen then will be not nearly so much as we have assumed, and we shall, therefore, not have nearly so much fibrine to account for. I question whether any one will, unless after careful examination, take upon himself to assert, that in a hydrocele containing eight ounces of fluid, there are not five or six grains of fibrine deposited in one or other of the methods pointed out*.

* I have found by actual experiment, that where the specific gravity of a dropsical effusion does not exceed 1020, it does not contain above 1·6 per cent. of albumen, which would reduce the quantity of fibrine to be accounted for in the above case to about two grains. We must recollect, that we cannot by a simple rule of proportion come at the quantity of albu-

The above is a hypothetical case, but I can instance one of actual and recent occurrence, which may perhaps be more satisfactory. A young woman with enlarged heart, the consequence of rheumatic fever, became the subject of anasarcous swellings of the legs, and of general dropsy of the abdomen. Her difficulties increasing upon her, it was thought advisable that she should be tapped, and the operation was performed on the 9th instant, (Nov. 1830). About twenty pounds of serous fluid were drawn off, of a greenish yellow colour, and transparent. Several flocculent masses of fibrine also passed the canula, and sank to the bottom of the vessel in which the stream was received; this fluid had a specific gravity of 1015, at fifty-nine Fah^{t}. A coagulum was formed on the application of heat, but much liquid remained even at a boiling temperature. I took 5000 grains of this serum, and by careful boiling, evaporation, and ablution, obtained all its albumen in a coagulated state. This was carefully dried at a low temperature, and the quantity thus

men in a liquid of given specific gravity. If we are to calculate, instead of actually collecting the albumen, we must take into account the specific gravity of dry albumen, the consideration of whether any condensation takes place on adding it to water, the question of the degree in which the specific gravity of the serum is increased by the salts it contains, &c. So that specific gravity, though a valuable indication of the relative quantity of albumen in serous fluids cannot be depended on as a basis for ascertaining its actual quantity.

collected amounted to sixty grains, or 1·02 per cent.; the whole amount then of albumen in the twenty pounds of serous fluid, was 1175 grains, for which, the average equivalent of fibrine should be 52·87 grains. I make little doubt, that nearly the whole of this amount might have been collected from the flocculent masses of fibrine, some of which passed the canula, and others of which might be reasonably supposed to have gravitated to the bottom of the abdomen. For the rest, it is not going too far to suppose, some deposition either among the viscera or on the peritoneal lining of the cavity.

The above instance renders it highly probable, that there is, generally, in cases of effusion, a considerable portion of fibrine deposited from the fluid poured forth, and I was strongly disposed to consider the rule general, and that Liquor Sanguinis was in all cases effused, so as to afford us a deposition of fibrine corresponding with the albumen met with in such effusion. Subsequent experiment, however, obliges me to alter this opinion, and to believe that where there is continued effusion, an actual secretion sometimes takes place of albuminous fluid. The following cases are in illustration of this fact.

Eleven days after tapping the young woman whose case has been adduced, she was found to

be filling again very fast. A few ounces of blood were taken from the arm, and this blood was found to contain 0·319 per cent. which is considerably above the average of fibrine, and only 3.51 per cent., which is equally below the average quantity of albumen; her serum had a specific gravity of 1023. I have no doubt that these undue proportions of fibrine and albumen were owing to a *secretion* into the cavity of the abdomen of albuminous fluid, without a corresponding deposition of fibrine.

The following instance illustrates the same fact. A woman of forty-eight years of age, who for ten weeks had complained of pains in her loins, anasarcous swelling of her legs, and general debility, was found to be passing urine which was in a high degree coagulable. It was clear, therefore, that albumen was thus abstracted from the blood, and it was a question whether any fibrinous deposition would account for the corresponding constituent of the Liquor Sanguinis. I examined her blood as drawn from the arm, and found it to contain 0·43 per cent. of fibrine, which is much beyond the usual average, and only 1·61 per cent. of albumen. The specific gravity of the serum was only 1020 at 60. I have, moreover, examined the specific gravity of serum in several cases with which Dr. Bright has furnished me, where patients have passed coagulable urine, and have always found it much below the usual standard; and although my

attention was not at the time directed to the relative proportions of albumen and fibrine, yet the specific gravity alone sufficiently indicated the deficiency of the former.

It is obviously of importance, in examining the truth of these observations, to note particularly not merely the quantity of an effused fluid, but likewise its specific gravity, which I have elsewhere observed* to mark with sufficient accuracy the relative quantity of albumen it contains. In the instance already adduced of effusion into the ventricles of the brain, we have seen that the quantity of fluid may be considerable, and yet little fibrine will be found in the vicinity. When we come, however, to examine the specific gravity of the effusion, or to test its power of coagulation by the application of heat, we shall find that scarcely any albumen is contained in it.

So in the case of ovarial dropsy, the specific gravity of the fluid contained in the cyst will be low where its walls are thin, and on the contrary loaded with albumen where in those walls we may recognize the corresponding equivalent of fibrine.

In the amnion, where there is little fibrine ne-

* See Paper in the Medical and Chirurgical Transactions, Vol. XVI. Part I. p. 57.

cessary to form so thin a membrane, there is also little albumen to be found in the fluid which it contains.

I have had one opportunity of examining the fluid from hydatids of the abdomen; its specific gravity was 1004, and it did not contain a trace of albumen even when evaporated to dryness. By the specific gravity in this case, we are furnished with a practical method of distinguishing between dropsy arising from hydatids, and general ascites. We are also thus furnished with another proof, if such were wanting, that these are independent animals, since the fluid they contain does not resemble the morbid effusions of those cavities in which they are found.

There is one circumstance which will probably strike every one on considering the constitution of the Liquor Sanguinis, as above stated. I mean its great resemblance to the chyle. Like it, the chyle separates into a fluid and a clot, the latter of which is nearly colourless. The nature of that clot is fibrinous in both cases, while the clear fluid is alike albuminous in both. The only apparent difference between Liquor Sanguinis and chyle as described by authors, is, the existence in the latter of an oily material. In a late paper read to the Society, I shewed that in the blood itself, an oil is always to be found, and its presence I conceive

to depend on its previous existence in the chyle. The principal difference then between chyle and blood, is, the existence of red particles in the latter, which it is evident are not derived from the former. We must therefore seek their formation in some of the viscera connected with the circulation. The spleen has naturally enough been looked to as their secreting organ, but I have examined with the most accurate and powerful microscopes the blood of a dog, whose spleen had been removed several months previously, and on comparing it with that of a healthy animal, it did not appear deficient in the quantity of its red particles. Whether the liver be destined to this office is a question which cannot be determined in the same manner, and so with respect to the other glandular viscera; but if we can certainly know that the red particles do not enter the circulation with the Liquor Sanguinis, and are not formed by the spleen, we at least narrow the limits of our ignorance, and make some advance towards the ascertainment of their probable source.

The foregoing observations I submit to the indulgent attention of the Society. How far they or the simple experiments on which they are founded may be new, I will not pretend to determine, being only able with certainty to affirm that they are, as far as I know, original with me. The question of their truth, however, is one of much

greater importance, and I shall be happy if they receive verification from the concurrent testimony of others. Should they, however, only lead by their examination and refutation to a more intimate acquaintance with the subject to which they refer, I shall still consider them as not entirely failing in utility.

OBSERVATIONS

ON

THE SYMPTOMS,

ATTENDING THE CHANGE

OF A

CIRCUMSCRIBED

POPLITEAL ANEURISM

INTO THE

DIFFUSED STATE:

WITH SOME PARTICULARS

OF AN

ANEURISM OF THE AORTA

THAT BURST INTO THE ŒSOPHAGUS.

BY SAMUEL COOPER;

SURGEON TO THE KING'S BENCH; THE BLOOMSBURY DISPENSARY; THE FLEET PRISON; AND HIS MAJESTY'S FORCES.

Read Feb. 8, 1831.

THE pulsations of aneurismal tumours sometimes undergo a sudden diminution, or even entirely cease, yet, this alteration in the character of the disease is not invariably connected with any of the desirable changes leading to, what is usually termed, a *spontaneous* cure. On the contrary, it is sometimes owing to quite a different cause, and one that is always productive of a great increase

of danger. The circumstance, here alluded to, is the sudden rupture of the aneurismal sac, the integuments remaining entire. Although, in this kind of case, the latter condition prevents all immediate risk of hemorrhage, the bursting of the sac may let the blood escape into the cellular membrane, and this frequently to a surprising extent*. The consequences are, that the circulation in the leg (if the disease be a popliteal aneurism) becomes seriously obstructed, the foot soon turns cold, and, if the extravasation attain a certain de-

* I restrict the term, *diffused* aneurism, to that form of the disease, in which the sac bursts, and the blood passes into the cellular membrane. When it collects in one mass, after its escape from the sac, and does not insinuate itself into the cellular membrane, it soon becomes bounded by a new kind of cyst, the product of the adhesive inflammation. The latter case is frequently denominated by writers the *circumscribed* false aneurism. I believe this sort of case, even when the quantity of blood on the outside of the original sac is very considerable, to be attended with much less danger of gangrene, than other instances, in which the blood is copiously injected into the cellular membrane. On the night, when this paper was read, Mr. Lawrence mentioned to the Society an instance, in which the mass of blood, collected in the thigh, was so enormous after the giving way of a femoral aneurism under the skin, that, when the coagula were removed, by means of a free incision in the swelling, some time after the artery had been tied, the finger could be passed nearly all round the thigh-bone for a considerable extent. But, notwithstanding this mass of blood, and profuse suppuration, the patient recovered.

gree, mortification ensues, whether the femoral artery be tied or not.

The change of an aneurism from the circumscribed into the diffused state, has been described by the generality of surgical writers; but I am of opinion, that certain particulars, relating to it, require greater attention than they have yet received, and that, without it, the obscurity, sometimes prevailing in the diagnosis, will be the occasion of many errors in practice. It is not enough to be informed, that, when the aneurism becomes diffused, its pulsations are reduced, or stopped, and the limb painful, with an alteration in the shape of the swelling, coldness of the foot, and a sensation, experienced by the patient, of something having given way in the limb. Frequently, there is rather a complaint of numbness, than of pain; and if the aneurism be large, the compressed and altered state of the popliteal nerves*, and the ef-

* "In the inveterate, and enormously large aneurism of the ham, the great popliteal nerves are always found stretched on the convexity of the aneurismal sac, of a reddish colour, tinged with blood, hard, and converted into a large compact filamentous expansion, incapable of supplying vitality to the leg and foot." Scarpa on Aneurism, translated by Wishart. Ed. II. p. 172. Pelletan, in describing the dissection of the knee of a patient, who died a year after having been operated upon for a popliteal aneurism, observes: "Le nerf poplité, qui se présenta d'abord, etait tuméfié, sous forme d'une gros ganglion, dans toute la longueur du creux du jarret." Clinique

fect of distention on the branches of the cutaneous ones, will fully account for the general torpidness of the whole leg. With respect to a sudden change in the shape of the swelling, whether this symptom occur or not, will depend upon the situation of the opening formed in the sac, the extent and place of the extravasation, and the degree of œdema affecting the integuments. If the sac give way at a superficial point under the skin; the blood be effused in considerable quantity; and the limb be not already much enlarged from the œdematous state of the integuments; there will of course be a very manifest alteration in the shape of the swelling, and an evident and sudden extension, or increase of it. But, in the opposite conditions, that is to say, when the sac bursts at a very deeply seated point; when the blood is consequently injected into the cellular membrane between the muscles, and under the fascia; and when the integuments are already considerably thickened and swollen; a vast quantity of blood may be extravasated, without any remarkable change in the figure of the aneurismal tumour, or any very palpable increase in the tension and magnitude of the leg. As for the patient's having felt something break, or give way in the limb at the

Chir. Trans. Tom. I. p. 127. In many cases, the patients suffer acute pain, particularly in the stage of the disease, when the tumour is rapidly enlarging.

moment when the sac burst, it is a kind of information not constantly to be obtained, because the rupture is sometimes very limited at first, or may happen during sleep; and when the sensation is declared to have been experienced, little reliance can be placed upon the account, inasmuch as patients, with popliteal and other external aneurisms, frequently complain of cramp, and sudden attacks of extraordinary feelings in their limbs, without any change of the disease from the circumscribed into the diffused form*.

When the sac of an aneurism has burst in the foregoing manner, the propulsion of blood into it from the heart, can evidently no longer have the effect of producing a full and sudden distention of it, as more or less of that fluid will either escape

* I should be sorry to underrate the patient's consciousness of something having given way in the limb. In association with other symptoms, it certainly deserves consideration; but, it is not uniformly experienced, nor always mentioned. In the case, which I shall presently relate, the patient felt something snap in his leg, yet made no report of the circumstance to his medical attendants till a fortnight after its occurrence. When a patient perceives the repeated crack of something in his limb, and a sound similar to that of the tearing of a bit of cloth, and the tumour immediately afterwards increases rapidly, with acute pain, and enormous swelling of the limb, as happened in a case recorded by Guattani, (Singulare Femoris Aneur. Hist. V.) the state of things is sufficiently clear. But, it is not every case, that is so free from ambiguity.

from it into the cellular membrane, or collect in one mass out of the original sac. Sometimes, however, when the breach in the sac is under a certain size, the pulsations do not completely stop at first; their strength is only reduced; and several days may elapse before there is a total cessation of them. Now, unless we suppose, that the opening in the sac enlarges after its first formation, and that the subsequent decline and stoppage of the throbbing of the tumour, can be explained on this principle, we must look into other circumstances for an elucidation of this interesting fact.

In a case of the preceding description, several causes combine to render the pulsations weaker and weaker, and, at length, to extinguish them.

1st. The more or less impeded state of the circulation, that takes place in the limb, as soon as a considerable quantity of blood has been injected into the cellular tissue. And, in order that the extravasation may attain the degree necessary for the full production of this effect, a certain time is obviously requisite; the limited size of the opening in the sac, and perhaps also sometimes the particular situation of it, away from the main current of blood, preventing the effusion from becoming all at once copious and extensive. By degrees, however, the quantity of blood in the cellular membrane increases; and then its pressure not only

creates a great deal of irritation, but actually interferes with the regular supply of blood and nervous influence to the limb. Hence, the alarming fall of temperature in the foot, and the well known tendency to gangrene, consequent to the change of a circumscribed popliteal aneurism into a diffused one.

2dly. Another cause, that has a powerful effect in gradually putting an end to the pulsations, is the increase in the quantity of coagulated blood and fibrine in the sac; the inevitable result of the stream of blood through it becoming more and more retarded, in proportion as the obstruction of the circulation in the leg is augmented *.

I have been led into these reflections by the observation of a popliteal aneurism, the history of which is in several respects highly interesting to the practical surgeon.

In the beginning of last April, I was desired by Mr. Nicholson, of Coburg Place, in the Borough

* In one example, in which the front portion of the sac of a popliteal aneurism had given way, and the blood had collected in a mass behind, and at the sides of, the femur, a part of the firm coagulum, thus accumulated, had compressed and flattened about two inches of the artery. The popliteal vein was also obliterated. This case is recorded by Mr. Lawrence in the 8th vol. of these Transactions.

Road, to visit Mr. Lucas, an organ builder, in the Waterloo Road, a large robust man, of gouty habit, about 48 years of age. I found him confined to bed, with an extensive and prominent swelling at the back of the left knee. The tumour not only filled the ham, but extended over the sides of the condyles of the thigh-bone towards the kneepan, and reached some way under the gastrocnemius muscle. Its pulsations were remarkably strong, and equally manifest both to the sight and the touch. The integuments, on the back part of it, were at one point somewhat red and inflamed; the foot torpid; and the limb, from the knee downwards, of great size from the effect of œdema. It is curious, that the disease should have existed five years, without the patient having had any suspicion, that his lameness arose from something more serious, than a gouty, or rheumatic affection of his knee; and, notwithstanding the present magnitude of the swelling, he had continued to follow his trade, with scarcely any interruption, until the day when I first visited him.

As the disease appeared urgent, I advised Mr. Lucas to let me tie the femoral artery, and explained to him the hazard of delay. His answer was, that he should be prepared for what had been recommended, in a week or ten days, at

the expiration of which, he should have completed some pressing engagements in business.

Three or four days after my first visit, I learned from Mr. Nicholson, that the patient, instead of having been able to get up, and attend to the engagements in question, had been severely attacked by gout in the right foot and both wrists. This additional complaint lasted about a fortnight, and, on its subsidence, it was remarked, that *the throbbing of the aneurismal tumour had undergone a considerable diminution, without any material alteration in the general appearance of the swelling and limb, except that a slight purple discolouration was perceptible a little above the internal malleolus.* The numbness of the foot was also somewhat increased.

Five days after the period, when the pulsations of the tumour had been observed to have declined, I visited the patient again, and found the abovementioned discolouration very manifest, though not of much extent, and somewhat resembling an ecchymosis; *the foot had become all on a sudden extremely cold;* there was some sensibility about the ankle and instep, but none in the toes; and no throbbing whatever could be perceived in the swelling. In other respects, the limb remained without alteration.

It was now a question in what way, and from what cause, the total stoppage of the pulsations had arisen? From the time, that I first heard of the reduction of their force, I hoped, that this circumstance might be connected with changes, which had lessened the transmission of blood into the aneurismal sac, and I was still inclined to believe, that the complete stoppage of the throbbings depended upon such transmission having been effectually cut off. As there had been *no change in the shape of the tumour*, *no diminution of its firmness*, and *no material increase in the swelling of the leg*, I entertained no suspicion of a rupture of the sac. However, the sudden fall in the temperature of the foot, *the increasing frequency of the pulse*, and the risk of gangrene, raised doubts in my mind, whether the view which I had taken, might not be erroneous. I requested therefore, that a consultation might be held with Mr. Lawrence the same afternoon (Friday), and directed the leg and foot to be in the mean while fomented.

We met at half past six o'clock in the evening. Mr. Lawrence, having applied his ear close to the swelling, said, that he could distinguish a sound in it, like that produced by the action of a pair of bellows; that this sound could proceed from no other cause, than the entrance of blood into the aneurismal sac; and that, on this ground, he was

in favour of tying the femoral artery. The same sound was also heard by myself and two other medical gentlemen present: no doubt therefore now existed, concerning the passage of a certain current of blood yet into the aneurism. At the same time, *the foot and lower part of the leg were remarked to be warm*, whereas they had been extremely cold in the morning. Although blood still entered the sac, I conceived, that it might only be doing so in a very diminished quantity, and that possibly, changes might be going on, which would soon completely stop the influx of blood into the aneurismal cavity. Indeed, as no suspicion arose of a rupture of the sac, it seemed to me impossible to account for the cessation of pulsations on any other principle. At my suggestion, therefore, the operation was put off.

As there was no improvement in the state of the limb on the following day, (Saturday,) Mr. Lawrence very properly urged the operation; but the patient could not be prevailed upon to submit to it.

On Sunday morning, at ten o'clock, directly after my return from a professional engagement, which had taken me into the country on Saturday, I visited Mr. Lucas again, and finding, that the risk of gangrene had not been lessened; that the tumour continued as tense and large as ever; that

the swelling of the whole leg was undiminished; that the bellows-sound was yet audible; that the apparent return of the natural heat in the foot and leg, noticed on Friday evening, had been owing to the assiduous use of hot fomentations; and that *the frequency of the pulse was increasing;* I persuaded the patient to let me tie the femoral artery, which I immediately did with the assistance of Mr. Nicholson and my nephew, Mr. George Cooper. The vessel was secured with a single ligature of strong fishing-line silk, introduced under it with an aneurism-needle, without any raising of it up with the finger, or any unnecessary detachment of it from its surrounding connexions.

As soon as the ligature had been tightened, the bellows-like sound in the swelling entirely ceased. The wound was dressed in the common manner. Without going into superfluous details, suffice it to mention, that the tying of the artery did not prevent gangrene, which shewed itself in a very unequivocal form on the fifth day after the operation, when it became absolutely necessary to amputate above the knee. The pulse was then 130, the restlessness and anxiety rapidly increasing, and the skin of a considerable portion of the leg black, or livid. The bone was sawn through about an inch and an half below the ligature on the femoral artery, which was observed not to bleed. The day after the amputation, the pulse had fallen to

110, and every thing went on so favourably afterwards, that, in the course of six weeks, the patient's recovery was complete.

The amputated limb was taken to the house of Mr. Hooper, surgeon in the London Road, who had kindly given his assistance in the operation, and the state of the aneurism was carefully examined. The sac, which was of unusual size, was filled with coagulated blood. As a waxen composition, thrown into the popliteal artery, readily passed amongst the coagula in the sac, that vessel must have retained a free communication with the latter part. The lower and most deeply situated portion of the sac, under the gastrocnemius muscle, was found to have given way, and the intermuscular cellular membrane was copiously injected with extravasated blood down to the very heel, some of it actually lying on each side of the tendo Achillis.

The foregoing case illustrates various interesting points:

1st. It exhibits the peril of delaying the application of a ligature to the femoral artery, when a popliteal aneurism is of considerable size; for, although there may be no immediate danger of the skin giving way, and of the patient losing his life by hemorrhage, the sac is apt to burst, and the

disease to change from the circumscribed into the diffused state, with all the disadvantages and risk inseparable from the latter condition. I may say, indeed, what has been long ago declared in my surgical writings, that no popliteal aneurism ought to be allowed to become very large previously to the operation, and that serious impediments to the patient's perfect recovery originate from the increasing size of the tumour. At the period, when I published the early editions of my "Dictionary" and the "First Lines of Surgery", every surgical treatise, and, I believe, every lecturer, defended the custom of not expediting the operation, until the anastomosing vessels had had time to enlarge. The doctrine is now happily abandoned in almost every surgical school of repute, experience having proved, that the communications, by which the circulation is to be carried on after the femoral artery has been tied, are more likely to be obliterated by the distention of an immense aneurismal swelling, than enlarged and rendered freer from the effect of the disease *. By delay, we suffer the mus-

* I consider the advice, here delivered, perfectly correct, and that the inference, brought against it, by a few writers from their view of what happens in cases of wounded arteries, is totally inapplicable, (See Bégin in Dict. de Med. et Chir. Tome II. p. 419.) It is argued, that operations, for the cure of aneurisms of long standing, are more successful, than operations on wounded arteries; and that the difference depends upon the anastomosing vessels, in the first class of cases, having

cles of the knee to become permanently injured in their organization; a prodigious sac to be formed, which will require a great length of time to be diminished, and absorbed; the popliteal nerve to be converted into a thin expansion, not resembling its original structure; the popliteal vein to be obliterated; and the condyles of the femur and head of the tibia to be in part destroyed by the pressure of the disease *.

been gradually prepared for the establishment of the collateral circulation by the long existence of the tumour. If this view were correct, the aneurisms, most easy of cure, would not be those of moderate size; yet such is the result of the experience of the generality of surgeons in this country. To me, indeed, it is not very intelligible, how the expanding pressure of a large aneurism could possibly render the anastomosing arteries better qualified for carrying on the circulation, as many of them would undoubtedly be obliterated by it. The reason, why the ligature of the main artery of a limb is less successful in examples of wounds, than in those of aneurisms, appears more justly referrible to the violence frequently done to the limb by the same cause, which wounded the artery, and, in many instances, to the simultaneous division of important nerves, and to what makes diffused aneurisms so perilous; viz. the extensive injection of the cellular membrane with blood. When the external orifice of the wound is narrow, and the blood cannot escape outwards, the state here specified is often noticed.

* The disease of the knee-joint may be rendered so serious by the effect of the aneurism, as to be incurable, and even to prove fatal after the cure of the latter. Of this M. Pelletan gives a remarkable instance in his Clinique Chir., Tome I. p. 123.

2dly. It shows, that when the aneurism is large; when the leg and foot are already much swollen; and when the sac has given way in a deep situation under the fascia and muscles; the blood escapes into the intermuscular cellular substance, where it produces so *little change in the general appearance both of the tumour and of the limb*, that the rupture of the sac is hardly to be suspected, unless other circumstances be taken into consideration.

3dly. The decline, or total subsidence of the pulsations of an aneurism may depend, either upon some of those changes, which bring about a spontaneous cure, or, upon the bursting of the aneurismal sac. The latter occurrence would demand the speedy performance of the operation of tying the femoral artery; while, in the cessation of pulsation from other causes, such interference of the surgeon would be highly improper. Hence, the discrimination of one kind of case from the other, is a business of great importance to the welfare of the patient. Now, the example, laid before the Society, proves the *usefulness of auscultation in determining the question, whether blood continues to enter the aneurismal sac;* a point of consequence, when the pulsations seem to be completely extinguished. If, in this condition, the sound, like that of a pump, or pair of bellows, could not be distinguished with the unassisted ear, or by means of

a stethoscope, the presumption would certainly be against an immediate recourse to the ligature of the femoral artery *.

4thly. The case before us proves, that *the extensive injection of the cellular membrane with blood, creates a great deal of irritation* in the limb, as well as obstruction of its circulation, and that *the effects are felt by the constitution at large*, as indicated by thirst, anxiety, acceleration of the pulse, and other symptoms of fever, even when the torpid state of the limb prevents the patient from making much complaint of pain. I consider, therefore, *an acceleration of the pulse, following the abatement, or stoppage of the throbbings in the tumour*, as another ground for suspecting a rupture of the sac.

5thly. *A sudden fall in the temperature of the foot, occurring soon after a remarkable decline in the aneurismal pulsations, or after they have become imperceptible*, is another symptom, which, in conjunction with the other circumstances to which I

* The plan of judging of aneurismal tumours, by listening attentively to the peculiar sound within them, is by no means a modern invention. The *frémissement sourd* of certain aneurisms is mentioned by the old French surgeons quite as frequently as the *bruit de soufflet* by those of the present day. Sometimes they compressed the artery leading to the swelling, so as purposely to produce a temporary cessation of the sound, and, then removing the pressure, allowed the *frémissement sourd*, as they termed it, to go on again.

have adverted, tends to corroborate the suspicion of a rupture of the sac, and of deeply seated extravasation. The surgeon must be cautious, however, not to be deceived by an apparent return of warmth to the foot, when hot fomentations have been assiduously continued by the attendants; for, in the case before the Society, the communication of heat to the foot from this cause, which was not recollected at the moment, was mistaken for a natural rise in the temperature of the part, and, with me, was one of the chief reasons for postponing the operation on the Friday evening *.

6thly. The foregoing case also shows, that, notwithstanding the depth of the extravasated blood under the muscles, and under the fascia, and under integuments vastly thickened by œdematous effusion, the rupture of the sac, and the extensive effusion of blood, soon give rise to *a purple or livid discolouration at some point of the surface of the limb;* a symptom, which I should, in future, regard

* According to my views, this postponement made no difference in the result of the case, as I believe, that, at the moment, when the foot and lower part of the leg suddenly lost their natural temperature in the night of Thursday, and the toes their sensibility, the extravasation in the cellular membrane had attained such a degree, that the preservation of the limb by the ligature of the femoral artery, would have been absolutely impossible.

as one deserving of particular notice in estimating the real condition of the disease.

7thly. The instance, brought forward, exemplifies how very far the blood sometimes passes from the sac into the cellular membrane, when the aneurism changes from the circumscribed into the diffused form. In Mr. Lucas, as we have remarked, some of the extravasated blood was found on both sides of the tendo Achillis. In aneurism of the curvature of the aorta, this insinuation of the blood from a narrow aperture in the sac to a distant point, has occasionally produced a swelling in the neck, which has been mistaken for an abscess and punctured, so as to give rise to repeated, and, at length, fatal hemorrhage. Such an accident fell under the observation of Baron Dupuytren *.

* See Dict. de Méd. et de Chir. Pratique, Tome II. p. 433. 8vo. Paris, 1829.

In a short discussion, which followed the reading of the present paper to the Society, Mr. Macilwain mentioned a very curious case, in which the blood of an aneurism of the aorta had become so diffused, that an immense mass of it was found lying between the peritoneum and abdominal muscles. M. Richerand has recorded another instance, in which the sac of an aneurism of the lower portion of the thoracic aorta burst exactly at the point, where it lay between the crura of the diaphragm, and the blood then passed into the cellular membrane around the kidney, whence it afterwards made a passage through the muscles of the back, and

I shall conclude this paper, with a brief notice of an aortic aneurism, which was lately under the care of Dr. Pinckard, and which I had an opportunity of seeing.

The patient was John Backhouse, a muscular man, about thirty-eight years of age, by trade an axletree maker. He first applied to the Bloomsbury Dispensary on February the 11th, 1830. He had a strongly pulsating tumour, about five inches in diameter, very prominent, situated to the left of the dorsal vertebræ, and extending under the basis of the scapula, which was thrust considerably outwards by it. He complained of palpitations, oppressed breathing, and bloody expectoration. By means of bleeding, low regimen, digitalis, purgatives, and quietude, he was so much relieved in three weeks, that he was able to resume his work, which, laborious as it was, he continued regularly, and without difficulty, until the 16th of September, when he vomited up suddenly nearly three quarts of blood. He immediately fainted; but revived, and afterwards voided a large quantity of blood from the bowels. On the 27th of September, feeling himself even better than he had been before the loss of blood, he returned

formed another more external accumulation in the cellular substance on the left side of the lumbar vertebræ. The abdominal aorta was unaffected, though the original sac extended over it. See Nosographie Chirurgicale, Tom. IV. p. 79. Ed. IV.

once more to his trade, and continued his labour, without interruption, until the 6th of November, when, finding himself indisposed, he remained at home, and sent to the Dispensary for medical assistance. Dr. Richard Pinckard and Mr. Miller, who now visited him, found him much reduced, weak, and languid, with a feeble pulse. They were surprised, however, to find, that the large external tumour was no longer visible, though its pulsations were yet distinguishable, when the fingers were firmly applied to the part.

November 9th. After having vomited up rather less than a pint of florid blood, the patient suddenly expired.

November 11th. The body was opened by Mr. Miller, in the presence of Drs. Pinckard, Mr. C. Griffith, and myself. The heart and lungs were healthy. The aorta was found to have given way, a little below its arch. The aneurismal sac, which was ample, was behind in contact with the dorsal vertebræ, and the ribs; but the main portion of it extended between the diaphragm and the left lung, over the edge of which a prolongation was thrown in the form of a tumour, of about the size of a lemon. All the sac, situated under the left lung, and upon its edge, was filled with solid fibrine, arranged in concentric layers, the outer of which were particularly firm, resembling boiled

meat. The size of the whole mass of fibrine was equal to that of a half-quartern loaf. Towards the spine, the sac contained blood, some of which was in a fluid state. Here also the aneurism had formed an excavation by the absorption of the spinal ends of the sixth and seventh ribs, and of the transverse processes, and a considerable portion of the bodies of three dorsal vertebræ *. The left lung, though of a healthy colour and consistence, had evidently been seriously compressed. In the œsophagus, an ulcerated opening, not quite so large as a sixpence, communicated with the cavity of the aneurism. This aperture, through which the fatal loss of blood had occurred, as well as the earlier profuse bleeding, was on a level with the division of the bronchiæ, to which the sac was intimately connected by adhesions. In the stomach, three pounds of coagulated blood were found, besides several ounces of serum, and the duodenum contained another pound of blood.

In this case, the following circumstances seem to me most worthy of note:

1st. The patient's having survived the first

* The pressure of aortic aneurisms, which usually produces a greater absorption of the bone, than of the intervertebral substance, sometimes affects the medulla spinalis, and occasions paralysis. Laennec has published a very rare instance of an aneurism, that burst into the vertebral canal.

bursting of the aneurism from the 16th of September until the 9th of November, when a second copious hemorrhage took place, and proved fatal. He lived, therefore, nearly eight weeks after a communication had been formed by ulceration between the aneurismal cavity and the œsophagus, and this notwithstanding his having followed, during a considerable part of the time, the laborious occupation of a wheelwright *. No doubt, the fainting, induced by the first profuse hemorrhage, was the means of saving him on that occasion, by reducing the force of the heart's action, and promoting the formation of a coagulum directly over the aperture, that made the communication between the aneurism and the œsophagus.

2dly. The subsidence of the external tumour, following the first copious loss of blood, and, probably, in a great measure, produced by it.

3dly. The displacement of the basis of the scapula by the aneurismal tumour, when the disease was prominent and conspicuous by the side of the spine. I have never seen another aneurism of the

* On the evening, when this paper was read, Mr. Macilwain reported to the Society a case, in which an aneurism of the aorta burst into the duodenum. For some time before the patient's death, blood had been occasionally voided from the bowels, and, when the body was opened, a considerable quantity of coagulated blood was found in the intestines.

aorta that had this effect; but, the particulars of one example of this removal of the scapula from its right position, by the protrusion of an aortic aneurism, were transmitted to the Academy of Medicine at Paris, by Dr. Lenoble, of Versailles *.

4thly. In the case, now related, the pathologist cannot fail to admire the extraordinary efforts, made by nature to bring about the cure of the disease. For this purpose, the greater part of the aneurismal cavity had been filled up with successive layers of compact fibrinous matter. In fact, the only portion of the sac, not occupied by this substance, was that towards the vertebræ and the œsophagus.

I am much indebted to Dr. Richard Pinckard for an inspection of the notes, which he took of the case, as, without them, my account of it must have been less worthy of the attention of the profession.

* See Andral, Précis d'Anatomie Pathologique, Tom. II. p. 363. Decker has related a case, in which the pressure of an aneurism of the aorta destroyed not only the ribs, but a part of the scapula.

71, Great Russell Street,
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CASE

OF

AXILLARY ANEURISM,

SUCCESSFULLY TREATED,

BY T. CROSSING, ESQ.

SURGEON, DEVONPORT.

COMMUNICATED BY BENJAMIN TRAVERS, ESQ. F.R.S.

Read Feb. 22, 1831.

HENRY LOBB, a stout muscular man, æt. 46, and of Salcombe, a small sea-port in this county, admitted into the Parochial Infirmary, at Devonport, June 10th, 1830, with the following appearances.

There is a diffused pulsating tumour, situated immediately under, and closely in contact with, the right clavicle; extending to the cartilage of the fifth rib, stretching into the axilla, and over the point of the shoulder. It has a very tense, elastic feel, and the pulsation is generally rather obscure, but at other times is so distinct as to be seen at a considerable distance from the patient. The tumour is not compressible, but the pulsa-

tion can always be stopped by pressing on the artery above the clavicle. The arm from the shoulder to the extremities of the fingers is swollen to an enormous size; is benumbed, and has lost all power of motion. The pulsation at the wrist cannot be felt, and the arm is kept nearly at a right angle in consequence of the magnitude of the swelling in the axilla; the pectoral muscle and integuments covering it being stretched to the greatest extent. He is always in pain, and at times to a most agonising degree; is unable to lie back in the bed, but is continually in a sitting position, with the arm supported on a pillow, and the body bent forward. His countenance is marked with great distress.

The patient's employment has been that of a pilot and fisherman, which constantly exposed him to the vicissitudes of the weather. He had always enjoyed a good and uninterrupted state of health until about "thirteen" weeks since, when after exposure to a cold night, having his arms repeatedly, and for a considerable time, immersed in sea-water, he felt on the following morning great pain just above the elbow-joint, where there also appeared a little tumefaction. The pain, after increasing for a fortnight, became so severe, that he could no longer continue his occupation. He then applied to a surgeon of the neighbourhood, who considered it a case of rheu-

matism. Leeches, blisters, &c. were used, without relief. The forearm began to swell, accompanied with darting pains; the swelling increasing upwards, and the arm very soon becoming benumbed and useless. About a month from the time when he was obliged to relinquish his usual employment, he discovered a tumour, the size of a walnut, situated midway between the clavicle and tendon of the pectoral muscle. Its appearance at that part he thinks was nearly sudden. It gave him no pain, but he had previously for several days experienced great uneasiness in the axilla. It rapidly increased, and at the end of a fortnight attained the size before described.

At this period he presented himself to the notice of Mr. Cartwright, late surgeon of the Middlesex Hospital, who happened to be on a visit at Salcombe; and it was then for the first time that the disease was suspected to be aneurismal.

Mr. Cartwright recommended him to get into some public infirmary or institution without loss of time, for the purpose of undergoing an operation, as the only probable means of relief.

The poor man in consequence of being out of employ, and having no means to subsist on, was compelled to seek that aid which this, his parish, could afford him.

I saw him soon after his arrival; but from the fatigue of his journey, a distance of about thirty miles, he was unable then to enter into the particulars of his case. The history above detailed, I subsequently obtained from himself and his wife. I had no doubt of its aneurismal character; but as the parietes were feeling thick and firm, I conceived there was no ground for entertaining any immediate apprehensions. Merely to keep up the appearance of doing something, I directed a cold evaporating lotion to be used.

On the following morning I requested the opinion of several of my friends. The man was then enabled to give a very satisfactory account of himself, and left no doubt in their minds as to the nature of the disease; my own, as before observed, having been previously quite made up on the subject. It was thought advisable to submit him to some preparatory treatment before any attempt to operate was made, and he was accordingly placed on a low diet, occasionally bled, &c.; from which he experienced some trifling relief for about ten days. The symptoms then became so urgent that any further delay would have been unjustifiable. I therefore requested the favour of my friends, Dr. Thomas, and Messrs. Lower, Williams, and Baldy, to meet me in consultation; and they having fully concurred in the necessity

of tying the subclavian artery, that operation was performed on the following morning, June 23rd.

The patient was seated in an arm chair, the head directed to the left side, and supported by Mr. Buchan, one of the gentlemen who kindly gave me their assistance. The integuments over the clavicle being stretched upon the chest, I commenced my incision near the sternal attachment of the mastoid muscle, and cut freely on the bone for about three inches and a half; thus dividing at once the integuments and platysma myoides. The parts being now allowed to retract, left the lower margin of the incision half an inch above, and running nearly parallel with, the clavicle; and exposed the jugular vein to a considerable extent, which was easily drawn aside, and kept out of the way, with a blunt hook. The cervical fascia was next carefully divided from the clavicular edge of the sterno-cleido mastoideus to near the extremity of the wound, which brought into view the omo-hyoideus. This muscle instead of forming a triangular space, as it does in most instances, with the scalenus anticus and clavicle, ran in a line with, and just above, that bone. Finding this rather unusual course of the omo-hyoideus an impediment, I passed a director under, and divided it. The knife was now laid aside, and the remaining part of the operation

finished with the fingers, and a common director. Some loose cellular membrane, and a large fatty gland being removed, the artery was found immediately below this substance, and three considerable branches of nerves passing over the vessel, and in close contact with it. These were separated, and the ligature passed under it.

This part of the operation I found the most difficult. It required considerable force, and care to pass the point of the needle under without injuring the vessel, or separating it to a greater extent than is desirable, from its surrounding connections; but using Weiss's ingenious instrument, both these injurious effects were obviated, and the ligature brought up from the eye of the needle with great ease. I then raised the artery, and finding the pulsation of the tumour cease and nothing besides included, tied it with a double knot just before it passes over the first rib. One end of the ligature was cut off close to the artery, the other left hanging from the wound, the edges of which were now brought together, and secured with one suture and adhesive straps. During the operation, which was borne with great fortitude, two arteries were divided, and immediately taken up; and the patient on the whole did not lose more than two drachms of blood. From the time of leaving his bed to his return, a period of twenty-five minutes elapsed.

When the operation was completed, the tumour which had been the seat of constant distressing pain, soon became quite easy; and he was enabled to rest with his back supported by pillows in a way he had not done for many weeks; and the limb being enveloped in flannel, was placed in a suitable position. It retained the same temperature as the other. I left him in charge of a friend perfectly easy, and his mind composed. During the day he slept, and in the evening was refreshed and cheerful. Pulse eighty, free and soft.

June 24th. Six o'clock, A.M. Has passed a quiet night with some sleep; heat of the limb natural; the countenance much improved, and free from anxiety; pulse eighty-four; tongue a little furred, but moist; ordered a saline purgative mixture.

Twelve o'clock, A.M. Is quite easy; bowels have been freely purged. Pulse seventy-eight.

Ten, P.M. Has slept during the afternoon two hours, and perspired rather freely; limb continues as warm as the other; pulse eighty, and soft, though there is some throbbing about the shoulder, but the tumour is free from it; and on the whole he feels as comfortably as in the morning.

25th. Nine, A.M. He has rested well during the night; no pain in any part; heat of the limb continues natural; and he feels as if he could move his fingers. The arm is softer; the tumour more circumscribed, and compressible; pulse eighty-four; tongue clean, and moist; bowels open.

Ten, P.M. Remains as well as at the morning visit, and is inclined to sleep; during the day has gently perspired.

June 26th. Ten o'clock, A.M. Slept well; quite easy and cheerful. The tumour in some degree diminished; pulsation at the wrist doubtful; has a tingling sensation in the arm and hand, both which preserve a due degree of warmth. Tongue clean, and bowels regular. Pulse seventy.

June 27th. The patient still going on satisfactorily. Dressings removed; wound looks well, and healing fast. The tumour is considerably less; has left the point of the shoulder, and feels softer in the axilla; but œdema of the arm does not abate. The bowels are regular; appetite increasing; and he is allowed to take some chicken broth.

July 2d. Has gone on well since the last re-

port. The wound is healed with the exception of a small space where the ligatures are. The tumour has receded below the clavicle, is circumscribed, and has a fluctuating feel, particularly in the axilla, where a livid spot the size of a sixpence is observed. He feels a pricking sensation in the hand and fingers. Pulse seventy.

July 6th. One of the ligatures with which a small artery had been tied, came off this morning on dressing the wound, and in the evening slight hæmorrhage took place, but was easily subdued by cold applications. The patient became alarmed, the pulse rising to eighty-four, and throbbing, and the tumour more diffused. V. S. ad ℥xvi.

July 7th. There has been no bleeding since last night, and he feels more composed. The tumour is again lessened, but there is considerable pulsation above the clavicle. The blood is sizy. He complains of a sore throat and headach. Pulse eighty, full and hard. V. S. ad ℥xvi. Felt a little faint from the bleeding. Ordered Haust. Cathart. statim. Pil. Colocynth. c. Hyd. Submur. vespere: repetatur Haust. Cath. mane.

July 8th. Nine o'clock, A.M. The night has been passed tolerably; headach relieved; but sore throat continues. Pulse eighty. Bowels have

been well purged. Ordered Mist. salina c. Ant. Tart. alterna quaque hora s.

Eight o'lcock, P.M. He has had a teasing cough during the day. The pulse continues full, and harder than in the morning, and the beating round the ligature is very strong. V. S. ad ℥xvi. followed by slight syncope. Continue the purgative mixture. Bolus with six grains of submuriate of mercury.

July 9th. He is quite relieved; has slept well during the night, and had free perspiration. Cough abated; pulse seventy-six, and soft; and the throbbing over the clavicle nearly gone. The blood very much cupped and buffed. Bowels open.

In an operation of this kind to secure the life of the patient appears the chief, if not the sole object at which we aim; and in that respect from this time every thing went on most favourably, without indeed the least interruption. It would therefore answer no one useful purpose to carry on any further a diurnal statement of the case.

The ligature about the artery was retained for an unusually long period. It did not come away till the eighty-fifth day, although for several weeks

some force was employed to promote that process.

At this time, Dec. 28th, 1830, the man's general health is as good as can be; the circulation free and perfect throughout the limb; and nothing left of the tumour but a little thickening in the sac of the aneurism, along the edge of the pectoral muscle. There remains, indeed, some want of strength and sensation in the limb; but this cannot create surprise, when it is considered how long the muscles were kept in a state of complete inactivity, and the nerves exposed to the pressure of a tumour, occupying a space of twelve inches by eight.

In conclusion, I would recur to what I have stated, in describing the operation, respecting the existence of a gland immediately over that part of the artery, which was tied. This I have reason to believe is scarcely a deviation from ordinary structure, as in not less than a dozen subjects, whom I have examined, the same substance was found precisely in the same situation. I would therefore beg leave to ask whether, in most cases, this gland may not prove to us a better guide than the scalenus muscle; because from its being seated immediately over that portion of the artery which is usually tied, we are thus at once

directed to the vessel, and enabled to separate it from its contiguous cellular tissue to less extent than by any other mode. At all events, should the gland be occasionally found wanting, the muscle will still remain as useful to us as ever.

Perhaps it may not be amiss to mention here, that since the operation, it has been discovered, that the patient for more than ten years has been afflicted with an extremely large irreducible hernia. This fact gives additional confirmation to what I believe, from general experience, was previously well known; namely, that such an extensive detrusion from their natural situation of parts so essential to life, does not at all interfere with the successful result of some of the most important surgical operations.

OBSERVATIONS

ON THE USE OF

TOBACCO,

AS A

LOCAL APPLICATION IN GOUT

AND OTHER CASES OF

CONSTITUTIONAL INFLAMMATION.

By JOHN VETCH, M.D.

PHYSICIAN TO THE CHARTER HOUSE.

PRESENTED BY B. BABINGTON, M.D. F.R.S.

Read May 10, 1831.

UNDER other circumstances it had been my intention to give to the public a series of detailed cases to establish the beneficial effects of tobacco as a local application, and one capable of alleviating in a great degree, and of sometimes altogether arresting various forms of specific inflammation, more particularly gout and rheumatic inflammation attacking synovial membrane. Besides the power which this vegetable possesses in allaying the pain and abating the inflammation of

gout, it assists the parts most materially in recovering their tone and strength.

The sensible effects of tobacco upon the skin and cuticle are readily perceived, by immersing, for a short time, the fingers in an infusion, or in a watery solution of the extract.

The infusion forms a valuable application in all cases of erysipelatous inflammation, and the only precaution to be attended to, is not to apply it to any part contiguous to the stomach, unless the production of nausea be at the same time desirable.

I was led to appreciate the valuable sedative and astringent power of tobacco in the first instance, by the benefit I derived from it in cases of the last mentioned class, having many years ago instituted an extensive trial of all the known narcotics, with the expectation of deriving additional aid in the treatment of purulent ophthalmia.

The good and the powerful effects which I obtained from the tobacco, fully compensated for the inefficiency of all the other local applications I then tried; its effects were notorious to all who saw it employed, and I now, as I ought to have done twenty years sooner, recommend its use to general notice, in cases of acute migratory in-

flammation, and especially when it attacks the joints, testicle, or sclerotic coat of the eye.

The infusion as directed by the London Pharmacopœia is sufficiently strong, and in many cases it is well to rub the part with eau de cologne after the use of the tobacco.

Charter House,
28th Feb. 1831.

CASE

OF

AXILLARY ANEURISM,

SUCCESSFULLY TREATED

BY TYING THE SUBCLAVIAN ARTERY.

By CHARLES MAYO, Esq.

SURGEON TO THE COUNTY HOSPITAL IN WINCHESTER.

PRESENTED BY MR. STANLEY.

Read May 24, 1831.

" MY DEAR SIR,

JUST ten years ago you did me the favour to communicate to the Medico-Chirurgical Society a case of Axillary Aneurism, in which I had tied the subclavian without success*, I have now great pleasure in forwarding to you the following case, in which I conceive my success may be attributed to avoiding the delay of the operation which took place on the former occasion.

" Your's very faithfully, &c.

" CHAS. MAYO."

" To EDW. STANLEY, Esq.
" Lincoln's Inn Fields."

* Vide Med. Chir. Trans. Vol. XII. p. 12.

March 19th, 1831. William Matthews, aged 49, a gentleman's groom, and a pensioner from the 14th regiment of dragoons, applied for my advice respecting a painful affection of the left breast and shoulder, from which he had suffered more or less for the last month, and had been bled and treated with sudorifics and embrocations, under the idea that his complaint was rheumatism. On removing his clothes, I observed a considerable tumour beneath the left clavicle, which from its pulsation, I recognized to be aneurismal; and from its ceasing to pulsate and becoming flaccid when I pressed upon the subclavian artery, where it passes over the first rib, I immediately decided that his disease was an aneurism of that vessel, at the point where it assumes the name of axillary. I bled him to twenty ounces, and ordered him a mixture with Antimon. tart. and Tinct. Digital., desiring him directly to leave his employment and keep his arm in a sling. He could not remember that he had perceived any thing of the swelling, till within the last fortnight.

March 20th. I found him in bed lying quite still on his back, which he said was the only posture in which he could obtain ease, from the violent gnawing pains about the shoulder, breast, and back, evidently arising from the irregular distention of the axillary plexus of nerves by the aneurismal sac. He had taken an opiate at bed time,

and an aperient this morning, with good effect; continuing the mixture with Digitalis, which appeared to have moderated the fulness and frequency of the pulse.

24th. He continued the same treatment at his own house till this afternoon, when he was removed to the hospital, where after due consultation, it was resolved that the progress of the disease could only be effectually arrested by placing a ligature on the subclavian above the clavicle, and that with as little delay as possible.

26th. At ten this morning, with the assistance of my colleagues, I proceeded to the operation, and drawing down the skin of the neck, I made an incision about three inches and a half in length on the surface of the left clavicle, extending from the insertion of the sterno-cleido mastoideus muscle to the clavicular portion of the trapezius; by this the platysma myoides was exposed, which as well as the subjacent fascia I carefully divided, for upon the latter many branches of the external jugular vein were found, several of which I was obliged to divide in the progress of my dissection through the cellular substance, and secure them with ligatures. I traced the edge of the omohyoideus muscle, traversing the upper part of the wound, and directly below it I could place my finger on the artery as it passed over the first rib,

which seemed to be about an inch and a half or two inches from the surface; to this point I directed all my attention, and endeavoured to clear my way to the artery by cautious touches with the edge of the scalpel, and by tearing the cellular substance with its handle and with a director, till at length I was able to get my nail upon the rib and then under the artery, so that after various efforts I passed a common blunt aneurismal needle under it, armed with a strong round ligature, and having ascertained that nothing else but the artery was included in the ligature, I tied it with a double knot, drawing each knot tight with the iron rings invented by the late Mr. Ramsden. The subclavian vein appeared just within and below the superior border of the clavicle, but formed no impediment to the operation; the branches of the external jugular, however, were very annoying, and kept the wound continually filled with blood, and the apprehension of wounding larger branches limited the extent of the internal wound to two inches at most. He bore the operation with great courage, though with some impatience, as it occupied rather more than twenty minutes; the pulsation ceased, and the pains in the shoulder were much relieved. In the evening he felt his neck very stiff and sore, and was harassed with a short cough, which shook him, without enabling him to expectorate. He took tea and gruel, and had an opiate at bed time.

27th. Had passed a tolerable night, but was sick and faint this morning, which may be attributed to the opiate; took Pil. Cambog. C. gr. v. which moved his bowels two or three times. Pulse eighty-four; left hand and arm quite warm, but feeling heavy, and no pulse at the wrist; wound easy, tumour greatly subsided. Being feverish and worried with cough at night, I took f℥viij. of blood from the arm, which was slightly buffed.

28th. Had a better night, and the cough much relieved by the bleeding. Dressed the wound, and found the edges united except where the ligature passed out.

30th. Dressed the wound, and found considerable discharge; tumour much reduced, and apparently empty.

April 1st. A feeble but regular pulsation was this day felt in the radial artery at the left wrist.

3d. Dressed the wound without finding much discharge; he had a severe rigor while sitting out of bed at the night-table, which was relieved by a dose of Sp. Ammon. Co. with Tinct. Opii.

5th. Complains of pain in the aneurismal sac; pulse eighty-four, and that in the left wrist improving in strength.

6th. I found this morning that a considerable quantity of grumous bloody discharge had escaped from the wound, which had opened a little at its acromial extremity, as well as at the point where the ligature passes out, and it appeared to me that the discharge came from the cavity of the sac, as it was much more flaccid. In the evening so much more had discharged as to require dressing again.

10th. Several small ligatures on the veins have come away within this day or two; the same bloody discharge has continued more or less, and seems now to flow from the tract of the ligature, so that it seems probable that the ligature has separated on the axillary side, and that the discharge may come from the sac through its unclosed mouth, as the dilatation of the artery commenced very near the point where the ligature was applied. Pulse seventy-eight, appetite good, and cough less troublesome, but the pulse at the left wrist has not been perceptible for the last two days.

13th. The ligature came away this morning, and appeared to have been separated some time, as the knot was just within the orifice, entangled in some spongy granulations.

18th. The wound continues open at two

points, where spongy granulations protrude and are daily touched with Argent. Nit.—Pulse returned in the left wrist, and he is otherwise in good health.

April 23d. I passed a director from one fistulous opening to the other, and divided about three quarters of an inch of the cicatrix between them, afterwards touching the whole surface with Argent. Nit.

26th. Wound much contracted, but still spongy. Caustic continued, with lint and sticking plaster. He leaves the ward and walks out of doors.

May 2d. His strength improves daily; applied the Hydr. Nitrico-oxyd. to the small fungous fistula still remaining.

10th. The wound is completely cicatrized, and he will have his discharge as cured, to-morrow. The tumour has quite disappeared, and the arm is recovering its strength, but the pulse is not now to be felt at the wrist.

In concluding my account of this case I should observe, that the patient was of an athletic frame and six feet in height; that the tumour at the time of the operation extended nearly the whole length of the clavicle, and consequently was four or five

inches long and about three inches in depth, but the clavicle did not appear to be much displaced. I am happy to add one to the few instances confirming the propriety and success of this operation, and there can be no doubt that its failure has in most instances been owing to the advanced stage of the disease, when the operation was undertaken; the proximity of large branches to the point where the ligature is applied, as stated in my former case, may also be a cause of failure, which also must be increased by delay, as we may conclude that they will acquire a greater magnitude from the obstruction of the aneurism beyond; it strikes me that this objection may be somewhat avoided by applying the ligature upon that part of the artery which lies upon the rib, and as far as possible from the scaleni, for which reason I can see no necessity for exposing the edges of those muscles as some inculcate, neither can I see the necessity of dividing the sterno-cleido mastoideus, which Mr. Key so strongly recommends in the valuable observations attached to his successful case in the 13th Vol. of the Med. Chir. Trans.

Winchester, May 14*th*, 1831.

HISTORY

OF

A CASE,

IN WHICH,

ON EXAMINATION AFTER DEATH,

THE PANCREAS

WAS FOUND IN A STATE OF ACTIVE INFLAMMATION.

By WILLIAM LAWRENCE, F.R.S.

PRESIDENT OF THE SOCIETY.

Read May 24th, 1831.

MORBID changes of all kinds are extremely rare in the pancreas, as well as in the salivary and lacrymal glands, which are similarly organised. It seems doubtful whether the modern pathological anatomists, who have had the most extensive opportunities of observation, have ever seen inflammation of this gland; at least no such affection is described by Baillie, Meckel, or Andral. "As for the pancreas," says the latter*, "I shall merely observe that its changes of structure are infinitely rare. I have found it redder than usual in some instances, and in others remarkably dense.

* Précis d'Anatomie Pathologique, Tom. II. p. 582.

In some bodies it has been compressed and diminished (comme atrophié) by scirrhous or tubercular masses developed around it, or in the intervals of its lobules. On one occasion I found the hepatic extremity changed into a greyish white, hard, and homogeneous substance, in which no trace of the normal organization could be observed. In another instance, I found in the middle of the gland, two small abscesses, each capable of holding a hazel nut. But, in general, we may affirm, that the pancreas is one of the organs most rarely diseased. To ascribe to it therefore an important part in certain gastric disorders, and to account for indigestion by changes in the pancreatic secretion, is purely hypothetical. The gland undergoes no observable change in the affections of the alimentary canal, or in those of the liver."

Dr. Baillie* met with one instance of abscess in the pancreas: the account of the symptoms which was communicated to him by Dr. Heberden, is so short and imperfect, as to render the case of little interest.

In his Cours d'Anatomie Medicale†, Portal has a long catalogue of pancreatic diseases, including inflammation, suppuration, gangrene, scirrhus, cancer, and ulceration; and he seems to consider

* Morbid Anatomy, Chap. XII.

† Tom. V. p. 351, et suiv.

all of them as of common occurrence. This statement is quite at variance with the opinions of the authorities before mentioned, and with the result of my own experience. I can only explain the contradiction, by supposing that Mr. Portal has adopted with too little discrimination the cases reported by older writers, and that he has admitted the existence of inflammation in the pancreas on insufficient grounds. He says that the pancreas has often been found inflamed, and that the stomach, duodenum, liver, spleen, and kidneys, have not been exempt from inflammation on the same occasions.

I offer the following case to the Society, because I have not met with any similar narrative in the course of my medical reading; and because it connects the symptoms and progress of the affection with the morbid changes which produced them.

CASE.

I saw, in consultation with a physician and with the regular medical attendant of the family, a lady about twenty-one years of age, who had been delivered a few weeks previously of her first child. She had been very weak and excessively pale during the latter part of her pregnancy, and she became still more so after delivery. Her state and symptoms were like those of persons

who have lost large quantities of blood; and her medical attendant considered that there was a defect in the process of sanguification. Under this view of the case, which was adopted by a physician who saw her soon after her confinement, cordials and stimuli, both medical and dietetic, were resorted to. No advantage resulted from this plan, and another physician was called in, who recommended calomel and opium, on the idea that inflammation had taken place in the chest, and that effusion had probably been the consequence. I saw her about thirty-six hours before death, when no hope of recovery could be entertained. She was excessively pale, with a rapid feeble pulse, hurried breathing, some fulness and uneasiness on the right side of the abdomen.

I learned afterwards that this lady had been most singularly troubled by thirst during her pregnancy, and that her mother, alarmed by her drinking cold fluids in large quantity, had represented to her that she feared the circumstance might prove injurious to the child. She had also suffered much from pain in the epigastric region, which was sometimes so severe as to oblige her to retire to her own apartment. In mentioning this circumstance, her mother drew her hand across the abdomen in the seat of her daughter's sufferings, and she pointed exactly to the situation of the pancreas. The gentleman who had regularly

attended this lady, was kind enough to favour me with the following account of her case from the commencement.

"MY DEAR SIR,

I have the pleasure of sending you the particulars of the symptoms which presented themselves in the case of Mrs. ——.

"At the time Mrs. —— married, she appeared to be in good health. When she was between five and six months advanced in pregnancy, she lost her usual healthy appearance, and gradually became very pallid. This change I observed on occasionally meeting her in her walks from her own to her mother's house, and on enquiring generally after her health, her answer invariably was, 'I am quite well.'

"About a month previous to her confinement, I, for the first time, was desired to see her professionally. She was then suffering from a severe attack of catarrh, accompanied with an incessant, irritating cough; it was attended with very little fever, her pulse, in frequency, being but little above the natural standard. This complaint yielded in about ten days to the usual remedies, when she declared herself to be quite well, and during its continuance no symptom was complained of that was not strictly catarrhal. Her skin was then completely bleached, and the prolabia colour-

less. I did not see her again until the 29th of January, the morning on which her labour commenced; she then looked and felt extremely exhausted, and I was anxious as to the result of her labour. On making the usual enquiry I found the presentation natural, the pains returning at pretty regular intervals; and she was delivered of a healthy female child. The placenta was expelled by the contraction of the uterus five minutes afterwards, and she did not, during the whole labour, lose two ounces of blood. The night after her labour, was passed without pain; she was tolerably tranquil, but got little sleep. It was evident on the third day after her delivery, that although the labour was comparatively easy, she had suffered much from the exertion. She felt so exhausted that she was constantly calling for sal volatile to smell, and occasionally to take internally, in order to prevent fainting: she sighed deeply and frequently. The least attempt to raise her head from the pillow produced a violent beating in the temples, but it subsided after a few minutes of perfect quietude. Her pulse was feeble and irritable, at about eighty-six beats in a minute. The bowels were rather relaxed. She was very thirsty, and had been so for three months previous to her delivery.

"On the fifth day after her confinement, Dr.—— saw her, and he repeated the examination I had previously made, by pressure with the hand over

the whole abdominal cavity, in order to discover if there was tenderness in any part, but our patient declared most positively, she felt neither pain nor soreness from the pressure. A similar examination was made some days afterwards with the same result. The feeling of exhaustion continued to increase, but she never complained of pain, till about a week before her death, when, on pressing the abdomen, a slight uneasiness was felt about the situation of the caput coli. This was noticed the following day by Dr. ——, who directed a mustard poultice to be applied to the part. About five days previous to her death, the stomach became irritable, and nothing but rennet whey in small quantities was retained. She died exactly five weeks after her delivery.

"I should observe that I do not recollect to have heard of Mrs. —— suffering severe pain in the epigastrium till it was mentioned by her mother after her death: she certainly never named it to me herself, and it does appear somewhat extraordinary, that when it existed, it should not have been thought of sufficient consequence to call for medical assistance."

Examination, thirteen hours after death.

The body had not lost its heat; the internal parts were warm to the touch.

The skin was universally and extremely pale.

No blood escaped on making the incisions necessary for exposing the abdomen and thorax and for sawing round the skull.

The membranes lining the abdomen and thorax, and the viscera contained in those cavities, excepting the pancreas, and spleen, were extremely pale, and almost bloodless. The appearance was like that observed in persons, who have died of hemorrhage, or under the state described by the term anemia. The liver and kidneys were pale, and the several portions of the alimentary canal quite white, without any traces of blood in them.

The heart was pale and rather large ; its cavities and the contiguous large vessels contained some fluid of watery consistence, about the colour of red wine, and small portions of soft coagula. The coronary vessels contained no blood. The muscular substance of the heart was pale and rather flaccid: the structure of the organ in other respects was natural. The lungs were healthy, except that frothy fluid escaped on cutting into their posterior part. The cellular texture around the pancreas and duodenum, the great and small omentum, the root of the mesentery, the mesocolon and the appendices epiploicæ of the arch of the colon were loaded with serous effusion. The fluid, which

was transparent, bright yellow, and of watery consistence, ran out in large quantity on cutting into the parts above mentioned, which were distended in some places to the thickness of two or three inches.

The pancreas was throughout of a deep and dull red colour, which contrasted very remarkably with the bloodless condition of other parts. It was firm to the feel externally; and when an incision was made into it, the divided lobules felt particularly firm and crisp. The texture was otherwise healthy. The part was left wrapped up in a cloth for nearly forty-eight hours after its removal from the body, the weather being then very cold. At the end of this time the hardness was gone, and the gland even appeared rather soft.

The spleen was rather large and turgid, livid externally, brownish red internally, and somewhat soft in texture.

The surface of the dura mater, covering the cerebral hemispheres, was lined in the neighbourhood of the falx, with a very thin, soft, and almost mucilaginous layer of light red tint; it could be scraped off with the handle of the knife, leaving the membrane of its natural appearance. There was slight serous infiltration of the pia mater. The blood-vessels of the brain were moderately

full. The distention of the cellular membrane by serous effusion in this instance was analogous to the œdematous swelling which often occurs round other parts when actively inflamed.

The pancreas is not unfrequently found after death, as it was in this case, preternaturally hard; and I suppose that the gland has been in this state in the numerous instances, in which we hear and read of its having been scirrhous. Although I do not know on what this hardness depends, I have never considered it as a morbid condition; because it occurs in individuals who have died of other diseases, without any symptoms referable to the pancreas; because the structure of the part is perfectly healthy in all other respects, and because the hardness soon disappears after death, as it did on this occasion.

PATHOLOGICAL AND PRACTICAL

RESEARCHES

ON

UTERINE INFLAMMATION

IN

PUERPERAL WOMEN.

By ROBERT LEE, M.D. F.R.S.

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IT has been known to physicians from the earliest ages, that puerperal women are liable to attacks of inflammatory and febrile diseases of a destructive character. From the time of Hippocrates to the middle of the seventeenth century, these were generally supposed to depend on inflammation of the uterus, excited by suppression of the lochial discharge, or on certain diseased states of the animal fluids, resulting from pregnancy. In more recent times, the greatest diversity of opinion has prevailed, respecting the nature and treatment of these acute disorders, some referring them wholly to peritoneal inflammation, while other observers, overlooking the local affection of the uterine organs, have described them as specific febrile diseases, under

the terms, puerperal, peritoneal, or child-bed fever.

In October 1829, when I had the honour of presenting to the consideration of this Society, my observations on inflammation of the veins of the uterus, I ventured to infer from the appearances I had witnessed in numerous dissections, "that Uterine Phlebitis is of far more frequent occurrence than has yet been suspected, and that to it must be referred many of the fatal disorders of puerperal women, which have usually been comprehended under the vague designation of puerperal fever or peritonitis."

At that period I had also arrived at the following conclusion, which subsequent experience has fully confirmed, "that inflammation of the uterus and its appendages must be considered as essentially the cause of all the destructive febrile affections which follow parturition, and that the various forms they assume, inflammatory, congestive, or typhoid, will, in a great measure, be found to depend on the serous, muscular, or venous tissue of the organ having become affected." *

From the 1st of January 1827, to the 1st of March 1831, including a period of more than four years, one hundred and twelve cases of well

* Med. Chir. Transactions, Vol. XV. p. 465.

marked uterine inflammation, have come under my observation in the British Lying-in-Hospital, and in public and private practice in the western districts of this metropolis. I have watched the symptoms and progress of these cases with the closest attention, observed the effects of remedies, and where death has taken place, I have carefully examined the alterations of structure, which have remained in the uterine and other organs.

Of forty cases which have proved fatal, the bodies of thirty-four have been examined, and in all of these, which had presented during life, the characteristic symptoms of what has been usually denominated Puerperal Fever, there existed some morbid change from inflammation either in the peritoneal coat of the uterus, or of the uterine appendages, in the muscular tissue, the veins or absorbents of the uterus, to account in a complete and most satisfactory manner for all the constitutional disturbance which had been observed. The peritoneum and uterine appendages were found inflamed in twenty-six cases, in fourteen there existed uterine phlebitis, in eight, inflammation and softening of the muscular tissue of the organ, and in four, the absorbents were distended with pus. The results of these observations, as far as they go, are therefore decidedly opposed to the opinion now generally prevalent in this country, that there is a specific fever, which attacks puerperal women, and which may arise independent of any local

affection in the uterine organs, and prove fatal frequently, without leaving any perceptible change in the organization of their different textures.

In the present communication I propose succinctly to describe the various changes produced by inflammation in the uterine organs subsequent to parturition: to point out the local and constitutional symptoms by which these morbid conditions are characterized during life, and to which combination of symptoms the terms, puerperal, peritoneal, or child-bed fever have been applied by different authors: and lastly, to describe the treatment which experience has led me to consider as the most safe and efficacious.

The following are the principal modifications of inflammation of the uterus in puerperal women which I have observed.

1st. Inflammation of the peritoneal covering of the uterus, and of the general peritoneal sac.

2dly. Inflammation of the uterine appendages; ovaria, Fallopian tubes, and broad ligaments.

3dly. Inflammation of the muscular or proper tissue of the uterus.

4thly. Inflammation and suppuration of the veins, and absorbent vessels of these organs.

These varieties of uterine inflammation may occur wholly independent of each other, though they are most frequently met with in combination. Peritonitis seldom occurs without some degree of inflammation of the uterine appendages, but both these textures may be severely affected, when the muscular coat of the uterus and the veins are wholly exempt from disease. The venous and muscular tissues of the uterus are also liable to severe attacks of inflammation, without any corresponding affection of the peritoneum by which they are covered, though it most frequently happens that inflammation when set up, either in the veins or muscular coat, involves also the peritoneum. In the organs of respiration similar varieties of inflammation may be observed, and the pleura, pulmonary texture, and the mucous membrane lining the air passages, may all be separately or simultaneously involved in the same attack. A similar observation may be extended to the brain and its membranes, and to the whole of the digestive organs, and the symptoms which characterize the inflammation of the different tissues of which these organs are composed have been as accurately determined, as they possibly can be, in the present state of pathological science.

I. Inflammation of the peritoneal covering of the uterus, and of the general peritoneal sac.

The effects produced by inflammation of the

peritoneal coat of the uterus in puerperal women do not essentially differ from those produced by ordinary peritonitis in the male sex. Where inflamed, the peritoneum becomes vascular, red, apparently thickened, and a secretion or substance of a yellow colour in the form of false membrane, is thrown out, producing adhesion of the abdominal viscera to each other: or a turbid, serous, whey coloured or red fluid, mixed with shreds of albumen or pus, is effused in greater or smaller quantity into the cavity of the peritoneum.

Puerperal peritonitis usually commences in the peritoneum of the uterus, and extends from thence with greater or less rapidity, according to the severity of the attack, to the general peritoneal membrane. In some cases, the inflammation is confined to the uterus, and it is generally most severe in this organ, or in the parts immediately contiguous. Even when it has extended to the other viscera and affected them most severely, the peritoneum of the uterus invariably exhibits signs of recent inflammation. The lymph is for the most part thrown out in thicker masses around the uterus than in any other situation, and this viscus has seemed to suffer in the greatest degree from the violence of the inflammation.

Sometimes considerable depositions of pus are formed beneath the peritoneal coat of the uterus,

which are either prominent and circumscribed, or diffused throughout the cellular membrane. This infiltration I have most frequently met with at the part where the peritoneum is reflected from the uterus and vagina to the rectum.

Inflammation of the peritoneal coat of the uterus is characterized by great tenderness of the surface of the organ, increased on pressure, and by pyrexia more or less severe. In every instance on a careful examination of the uterine region, there has been more or less pain in it increased by pressure, with constitutional disturbance, though it must be admitted that the pain and febrile symptoms have varied greatly in intensity.

When the attack of peritonitis is severe, the patient commonly lies upon the back, with the knees drawn up to the trunk of the body. At the onset of the disease, the abdomen is generally soft and flaccid, and, except in the region of the uterus, not affected by pressure. Dr. Hulme has described the pain as affecting the whole hypogastric region from the commencement of the attack, but this is the case only where the disease has made considerable progress, or has extended from the uterus to the general investing membrane of the abdomen. Though an enlarged and painful state of the uterus be never altogether wanting, yet the pain

often undergoes exacerbations similar to after pains, and is often mistaken for them by careless observers, and the disease is thus overlooked till a great part of the peritoneal sac is inflamed, and the case in consequence is rendered hopeless.

The whole abdomen at length becomes distended, tympanitic, and occasionally exquisitely painful on pressure. Vomiting of dark green coloured fluid substances follows. The pulse grows rapid and feeble, the tongue dry and brown, the lips and teeth covered with dark sordes, diarrhœa frequently supervenes, and death ensues at no very remote period.

The invasion of pain in the uterus is sometimes sudden, at other times the ordinary increased sensibility of the uterus, subsequent to the efforts of natural labour, or after pains, passes slowly and insensibly into the acute pain increased by pressure, which is the great characteristic symptom of uterine inflammation. Most frequently the accession of the disease is marked by rigors, partial or general, sometimes so slight as scarcely to be perceived by the patient, at other times so violent as to produce strong succussions of the whole body. The cold shivering after a longer or shorter duration passes away, and is succeeded by great heat of the surface, acceleration of the pulse and of the respiration, thirst, sometimes nausea, and

vomiting, and intense pain across the forehead. The rigors precede, accompany, or follow the increased sensibility of the uterus. In some of the most severe cases, there has been no distinct rigor, but a quick pulse, hot skin, and hurried respiration, have rapidly succeeded to the uterine pain. In some of the most unfavourable cases, the extremities have been cold, and the countenance anxious and pallid, after the disease has been completely formed.

There is no uniformity in the state of the tongue in puerperal peritonitis. It is sometimes covered with a thin, moist, white, or cream-like film, at other times it is red in the centre, with a thick, yellow, or white fur on the edges.

The lochia are often completely suppressed, in other cases only diminished in quantity. The mammæ usually become flaccid, yet in some fatal cases, the milk has been secreted till a short period before death.

Puerperal peritonitis may be confounded with the irregular contractions of the uterus, which constitute after pains and hysteralgia, and it must be admitted that in some cases it is difficult to draw a line of distinction between them. Where the pulse is accelerated, the remissions of pain incomplete, the lochia scanty or suppressed, in a large

proportion of cases we shall arrive at a correct diagnosis by considering the peritoneal coat of the uterus, or its deeper seated tissues in a state of congestion or inflammation, and employing antiphlogistic treatment. There are few puerperal women, except those of a feeble and irritable constitution, or who have been previously exhausted by hemorrhage, or some chronic disease, who are seriously injured by cautious depletion local or general; and where death has followed the abstraction of sixteen or twenty ounces of blood from the arm, the fatal result may fairly be attributed to the disease, and to the neglect of the remedy rather than to its abuse.

Intestinal irritation, depending on a disordered state of the bowels, is also liable to be mistaken for peritonitis, and treated by blood-letting to the injury of the patient. In this affection the abdominal pain is diffused, it is rather a griping than acute pain: it does not commence in the region of the uterus, nor is it aggravated by pressure. The abdomen is generally soft, puffy and distended. The tongue is loaded. There is thirst and headache, the lochia and milk are not suppressed, the febrile attack is usually preceded by evident signs of great intestinal derangement, flatulence, nausea, vomiting, constipation or diarrhœa. The constitutional disturbance attending intestinal irritation, comes on about the end of the first week,

whereas peritonitis manifests itself most frequently before the fourth day subsequent to delivery. The reaction which succeeds to uterine hemorrhage cannot easily be confounded with puerperal peritonitis. The morbid sensibility of the uterus, which characterizes inflammation, and the other symptoms already described are here entirely wanting.

II. Inflammation of the uterine appendages, ovaria, Fallopian tubes, and broad ligaments.

In one case only I have found the uterine appendages free from disease, where the peritoneal covering of the uterus has been inflamed, but frequently the peritoneum has been slightly affected, where the appendages of the uterus have been extensively disorganized. The surface of the broad ligaments, ovaria, and Fallopian tubes, have been red and vascular, and partially or completely imbedded in lymph or pus. The loose extremities of the Fallopian tubes, have been of a deep red colour and softened, and deposits of pus in a diffused or circumscribed form, have taken place in their cavities or in their sub-peritoneal tissues. Between the folds of the broad ligaments, effusions of serous or purulent fluids have also been found.

Numerous important changes have likewise

been observed in the structure of the ovaria. Their peritoneal surface has often been red, vascular, and imbedded in lymph, without any visible alteration of their parenchymatous structure, or their whole volume has been greatly enlarged, swollen, red, and pulpy; blood has been effused into the vesicles of De Graaf or around them, and circumscribed deposits of pus have been found dispersed throughout the substance of the enlarged ovaria. In several cases the entire structure of the ovaria, has been reduced to a broken down vascular pulp, no traces of their natural organization being left. These changes are accurately represented in the drawings now exhibited to the Society.

The ovarium appeared in one instance which I observed to be converted into a large purulent cyst, which had contracted adhesions with the abdominal parietes and discharged its contents exteriorly through an ulcerated opening. In another case which proved fatal, the inflamed uterine appendages, agglutinated together by lymph, had contracted adhesions with the peritoneum at the brim of the pelvis, the inflammation had extended to the cellular membrane, exterior to the peritoneum, and had given rise to an extensive purulent deposit in the course of the psoas and iliacus internus muscles, as in lumbar abscess.

In two other individuals who ultimately re-

covered, the purulent matter, formed in the situation of the psoas and iliacus internus muscles from inflammation of the uterine appendages, made its way through an opening at the upper part of the thigh. Contraction of the thigh on the trunk took place in both these cases, and continued for several months, but disappeared on the recovery of the patient. The uterus remains immoveably fixed to the right side of the pelvis, in a woman who six months ago had a severe attack of inflammation of the peritoneum, and uterine appendages of the same side a few days after delivery.

Inflammation of the uterine appendages being generally combined with peritonitis, to a greater or less extent, it is often difficult to establish a diagnosis between these varieties of uterine inflammation. The pain is less acute than in peritonitis, and is principally situated in one or other of the iliac fossæ, extending from them to the loins, anus, and thighs. On pressure the morbid sensibility will be found chiefly to exist in the lateral parts of the hypogastrium. The constitutional symptoms at the onset of the attack, do not materially differ from those which mark the accession of peritonitis, being often accompanied with strong febrile reaction, which passes speedily away, and is succeeded by prostration of strength, and the other appearances which characterize in-

flammation of the muscular and venous tissues of the uterus.

The following cases have been selected from the whole number observed, to illustrate the morbid changes, which have now been described as occurring in the peritoneal coat of the uterus and in the uterine appendages of puerperal women.

CASE I.

Mrs. Groom, æt. 28, No. 13, Little Coram Street, was delivered of her first child on the 6th March, 1827. On the 8th great tenderness of the uterine region took place, with suppression of the lochia, and febrile symptoms, which, being supposed by her medical attendant to depend on spasmodic contractions of the uterus, were treated with anodynes, and warm fomentations to the hypogastrium.

On the 10th (the 4th day after her confinement, and the first on which I saw her) the abdomen was tympanitic and exquisitely painful on pressure. The pulse 140, and feeble, the extremities cold, countenance haggard. There was incessant vomiting of a dark green fluid with diarrhœa, and she died in the afternoon.

Dissection.—The stomach and small intestines were inflated with gas. The peritoneum covering

the fundus and posterior part of the uterus, was of a bright red colour, and the cellular membrane underneath it in this latter situation was infiltrated with pus. The peritoneal coat of the small intestines was highly vascular in different parts, and the surface of the liver was partially covered with lymph. The uterine appendages on both sides were covered with pus and lymph, and the lumbar regions contained about a pint of a wheyish coloured turbid fluid. The consistence of the spleen was remarkably soft.

CASE II.

Elizabeth Marshall, æt. 23, No. 3, Crown Place, Soho. Was attacked on the 4th of March 1827. (the 3rd day after her delivery) with rigors, headache, vertigo, and sense of exquisite tenderness in the hypogastrium and right groin. The milk and lochia soon disappeared; blood-letting was employed on the 8th, and leeches were applied to the region of the uterus, but the tenderness gradually extended over the whole abdomen, which became as large as before delivery, and tympanitic. The pulse was rapid and intermitting. The tongue covered with a brown fur, singultus and vomiting of dark coloured matter succeeded, and she died on the 12th day after the attack.

Dissection.—The uterus with its appendages, and the small intestines were all imbedded in

thick masses of lymph and closely adhered to one another. The omentum, colon, and peritoneum lining the abdominal muscles were vascular, of a deep red colour, and partially coated with false membranes. About ℥x of sero-purulent fluid were contained in the cavity of the abdomen. The deeper seated tissues of the uterus were healthy.

CASE III.

Mrs. Laurens, æt. 42, at No. 5, Cumberland Street, Middlesex Hospital.

After a severe and protracted labour, was delivered of a still born hydrocephalic child on the 12th of February 1828. On the 14th there was a severe rigor, the lochial discharge was suppressed, and the uterus was felt above the brim of the pelvis, large, hard, and exquisitely painful on pressure. The pulse 120, with great prostration of strength.

On the 15th the pulse was more rapid and feeble, the abdomen tumid and every where highly sensible. Vomiting of green coloured matter took place, and she died about sixty hours from the period of delivery.

Dissection.—The uterus uncontracted occupied the whole brim of the pelvis; its peritoneal coat,

and that of the small intestines and liver was partially covered with thin false membranes, and two pounds of a brownish coloured fluid, with flakes of albumen and pus were contained in the peritoneal sac. A fibro-cartilaginous tumour of considerable size was found imbedded in the muscular coat of the uterus. The uterine appendages on the right side were red and vascular, and the ovarium was unusually soft and about three times the natural size.

CASE IV.

Mrs. Tiffin, æt. 32, No. 18, Mercer Street, Long Acre.

Delivered on the 7th July 1829. Labour natural. On the 9th, the uterus was felt above the brim of the pelvis large and hard, and it was very painful on the slightest pressure; lochia and milk suppressed; pulse 110 and feeble; tongue white; bowels open. Slight relief followed the abstraction of fifteen ounces of blood from the arm, and the application of leeches to the hypogastrium.

10th July. The whole hypogastrium is now exquisitely painful, and the abdomen is swollen. Pulse more frequent. There has been much nausea and vomiting during the night. Bowels open. V. S. ad ℥ xxiv. Eighteen leeches to the region of the uterus.

11th. Vomiting continues, abdomen less swollen, and pressure over the region of the uterus produces little uneasiness. Pulse rapid and feeble, respiration hurried, countenance sunk, occasional delirium. The whole surface of the body is now of a deep yellow colour.

She became gradually more feeble, and died in the evening.

Dissection. Present Drs. Sims, Clark, and Williams.—The abdomen was distended by a great accumulation of air within the bowels, the peritoneal coat of the small intestines was red, and vascular: the peritoneum of the fundus and anterior portion of the body of the uterus was coated with albumen, and the sub-peritoneal tissue in this situation contained a sero-purulent and gelatinous fluid. From the incisions made into the lower part of the body of the uterus there escaped pure pus, but whether this flowed from the vessels or muscular tissues it was not easy to ascertain. Between the folds of the broad ligaments there was a deposition of a gelatinous and purulent fluid, and both Fallopian tubes were of a deep red colour, softened, and their coats filled with pus. The right ovarium was of the size of a common hen's egg, of a pulpy gelatinous consistence, and its healthy organization entirely destroyed. The whole

presented the appearance of a soft, fibrous, vascular pulp; the left ovarium was similarly affected.

CASE V.

Mary Ann Hale, æt. 26, was delivered in the British Lying-in Hospital, on the 24th July 1829. On the 26th she had a severe rigor, which was speedily followed by pain in the region of the uterus, and febrile symptoms: eighteen ounces of blood were drawn from the arm, which produced but little relief; leeches and other antiphlogistic remedies were employed; the whole abdomen however soon became exquisitely tender, without swelling or tension; and death took place on the 29th, the 5th day after delivery. Cough, dyspnœa, and pain in the right side of the chest were experienced during the last two days of her life.

Dissection. The peritoneal coat of the uterus and the uterine appendages were coated with false membrane; that covering the small intestines exhibited the usual effects of intense inflammation. Several folds of the ilium were glued together by lymph. The surface of the liver was also coated with albumen, and about two pounds of a whey coloured fluid were contained in the abdominal cavity. The muscular coat and vessels of the uterus were in a healthy condition. In the left side of the

thorax there were traces of recent inflammation in the pleura, and substance of the lungs.

CASE VI.

Elizabeth McCreevey, æt. 25. Delivered of her first child in the British Lying-in Hospital, on the 29th of August, 1829. It was observed in the second stage of labour, that, during each pain, vomiting of a dark coloured fluid like coffee grounds took place. On the morning subsequent to delivery, the pulse was natural, the abdomen was no where tender on pressure, and the vomiting had not recurred.

In the afternoon she was however attacked with acute pain of the belly, rigors, and repeated fits of vomiting, and on the following morning the countenance was expressive of great anxiety, and the abdomen was swollen and extremely painful on pressure. The respiration hurried. Pulse 160 and feeble. Extremities cold. The vomiting continued unabated. Fourteen ounces of blood were taken from the arm, the abdomen was covered with leeches, and calomel and opium were administered every hour.

On the 1st of September, all the symptoms were aggravated, and she sunk in the course of the day.

Dissection.—The small intestines, particularly the ilium, were red and vascular, and here and there covered with lymph. A pint and a half of a turbid fluid was effused into the peritoneal sac. The peritoneum of the uterus was covered with florid vessels. The uterine appendages on both sides exhibited the effects of severe inflammation. The omentum, forming a tense broad band in front of the intestines, and firmly compressing them, was found adhering at its most depending part to the peritoneum covering the posterior portion of the cervix uteri. The adhesion of the omentum to the peritoneum did not appear to be recent.

CASE VII.

A patient of the Benevolent Institution, residing in Steward's Rents, Long Acre, who had suffered from anasarca and ascites in the latter months of gestation, was confined on the 5th of October, 1829. On the 7th she had an attack of violent pain in the region of the uterus with pyrexia; dyspnœa and pain in the right side of the thorax were also experienced at the same time. Copious venesection and leeches to the hypogastrium were promptly had recourse to, but the tenderness extended to the whole belly, and it became greatly distended and tympanitic. She died on the 5th day after the commencement of the disease.

Dissection.—The lungs on both sides inflamed and there was a copious effusion of fluid into the sac of the pleura on the right side. About two quarts of sero-albuminous fluid of a whey colour were contained in the peritoneum. The small intestines covered with florid vessels, and patches of thin false membrane. The uterus and its appendages were imbedded in thick masses of soft lymph. The muscular coat and veins of the uterus were healthy.

CASE VIII.

Mrs. Long, æt. 29. A patient of the British Lying-in-Hospital, was delivered, after a natural labour, of her first child on the 18th December, 1829. Mr. Stone, under whose care she was placed, and to whom I am indebted for the following report, was not called to see her until the 22nd, when he found her in a rambling state. The face was flushed, head hot. There was no tenderness, nor enlargement of the abdomen: pulse 130. A small quantity of blood was taken away, which was cupped and buffed.

On the 23d, she was considered better. The pulse was not quite so frequent. There was a good deal of rambling, but she had had some sleep. More blood was abstracted from the arm.

On the 24th, the tongue had become brown

and parched; the abdomen greatly distended and painful; the pulse rapid and intermitting.

She died on the 25th. The body was removed to 14, Gray Street, Manchester Square, where I was permitted to examine it with Mr. Prout on the 29th of December.

Dissection.—The sac of the peritoneum was filled with air. The whole abdominal and pelvic viscera exhibited the signs of acute inflammation. The omentum, red and thickened, had contracted adhesions by a soft yellow lymph, with the small intestines. The small and great intestines, liver, uterus, and its appendages were all coated with exudations of lymph. The uterine appendages on both sides were intensely red and vascular, and were more deeply imbedded in lymph than any of the other viscera. The muscular and vascular structures of the uterus were healthy.

CASE IX.

Mrs. Gyde, æt. 22, Brewer Street, Golden Square, after a natural labour, was delivered of her first child, on the 26th June, 1830. She continued perfectly well till the 28th, when she was attacked with rigors, suppression of the lochia, and great tenderness in the region of the uterus. Venesection to twelve ounces, and leeches to the hypogastrium were employed, and calomel and

opium were administered internally at short intervals by Mr. Stocker, of Welbeck Street, who saw her on the evening of the attack. The symptoms were not however relieved by these remedies. The pain extended gradually over the whole abdomen, during the three following days. The pulse became extremely feeble and frequent. The countenance sunk; respiration hurried. Tongue covered with a brown fur. Constant retching and vomiting. Before death, which took place on the 7th of July, (the 11th day after her delivery,) the belly had become enormously distended, tense and elastic.

Dissection.—About three or four pints of dark coloured sero-purulent fluid were contained in the abdomen. The peritoneal sac and great intestines were distended with a fœtid gaseous fluid. The uterus and its appendages, the omentum and small intestines were all imbedded in lymph, and their peritoneal coat exhibited the other signs of having been severely inflamed. Near the fundus uteri on the left side, immediately underneath the peritoneum, was a circumscribed deposit of pus about the size of a nutmeg. Another abscess of a similar description, was observed under the peritoneal coat of the body of the uterus on the left side.

The other tissues of the uterus were healthy.

III. Inflammation and softening of the proper or muscular tissue of the uterus.

The dark coloured mucous layer, which usually coats the inner surface of the uterus after delivery, has been supposed to be the result of gangrenous inflammation, and has been described as such by some pathologists. This ought not however to be confounded with the changes produced by inflammation of the inner membrane of the uterus, when it becomes softened or wholly disorganized like the mucous linings of the stomach and intestines in certain inflammatory affections. In two cases I have met with, the internal membrane of the uterus was soft and flocculent, and had undergone changes similar in appearance to those which are produced in it by maceration. In other cases not only has the internal coat been disorganized, but the muscular tissue to a considerable depth, or even through its entire substance to the peritoneum, has been of a dark purple, greyish, or yellowish hue, and so softened in texture as to be torn by the gentlest efforts made in removing the parts from the body.

The peritoneum covering the inflamed portion of muscular coat of the uterus has also been affected, and lymph has been thrown out over its

surface as in simple peritonitis, or the peritoneum has simply become of a yellow, red, or livid colour, no albumen having been deposited on its surface. The peritoneum has also been softened, where the subjacent tissue has been little if at all affected; more frequently however the softening has proceeded from the internal surface of the uterus to its peritoneal, and the muscular has been extensively disorganized without a corresponding lesion of the peritoneal coat of the uterus.

Inflammation and softening of the uterus have in some cases affected the muscular tissue of the fundus, body, and cervix of the uterus; in others these changes have been limited to the part where the placenta has adhered, which has become unusually thin and reduced to a pulpy state.

Small abscesses have been formed in a few instances in the proper tissue of the uterus, without any perceptible change in the surrounding substance of the organ, while in other cases all appearance of muscular fibre has been lost.

In the works of the different authors on puerperal fever published in this country, the rapid and destructive variety of uterine inflammation now described has scarcely been noticed, though it has been pointed out by several German and

French pathologists. Astruc, Vigarous, and Primrose state, that the uterus is liable to be attacked with gangrene and sphacelus; and other authors have recorded cases where gangrene of the uterus followed acute inflammation of the organ. Professor Boèr, of Vienna, has described this affection under the term Putrescence of the Uterus, and has observed its frequent occurrence in particular epidemics*. Luroth†, and Danyau‡, have more recently published extended accounts of this malignant affection, which occurs soon after delivery, and often runs its course with great rapidity. Among the 222 fatal cases of puerperal fever observed by M. Tonellè in the Maternité of Paris in the year 1829, there were forty-nine in which the muscular tissue of the uterus was found softened. M. Tonellè states, that softening of the uterus, after shewing itself frequently in the first half of the year 1829, and particularly about January, disappeared entirely in the months of July and August, which were characterized in a remarkable manner by the frequency of uterine phlebitis. Afterwards it began to rage anew with great violence in September and October, and disappeared again in the

* Naturalis Medicin. Obstetric. Libri VII. Viennæ, 1812.

† Mémoire sur le Ramollissement. Par G. S. Luroth. Repertoire Generale d'Anatomie Pathologique. 1828.

‡ Essai sur la Metrite Gangreneuse. Par A. C. Danyau, Paris, 1829.

last two months, during which time the mortality was inconsiderable.

Considerable obscurity, as has been well observed, exists respecting the ordinary effects of inflammation of the muscular fibres of the body, but one point may be considered as known and established, viz., that a result of inflammation in this tissue of the body is softening and gangrene *. That the destruction of the healthy organization of the proper tissue of the uterus, in puerperal women, is the consequence of an inflammatory process, may be inferred from the symptoms which accompany the disease, and from its occurring in combination with the other varieties of uterine inflammation.

Inflammation of the muscular coat of the uterus most frequently commences with pain of the hypogastrium, irregularity of the lochial discharge, and rigors, succeeded by the other symptoms of pyrexia. The countenance becomes pallid, and is usually expressive of great anxiety and distress. There is often severe head-ache, with delirium and other affections of the brain and nervous system, and so violent have these been in some cases, that the local affection of the uterus has com-

* Pathological and Practical Researches on Diseases of the Stomach. By J. Abercrombie, M.D. Edin. 1828.

pletely escaped detection during life. The skin is hot and dry, and sometimes of a peculiar sallow tinge, the pulse is rapid and feeble. The respiration hurried, with remarkable prostration of strength. The tongue soon becomes foul. The lips covered with sordes: occasional vomiting is experienced. The progress of the disease in some cases is rapid, in others it runs its course more slowly, being protracted to the eighth or tenth day.

It must be admitted, that the diagnosis of this variety of uterine inflammation, particularly where it is complicated with peritonitis or phlebitis, which is frequently the case, is difficult or even impossible. If the attack of inflammation of the muscular coat be sudden and violent, it becomes so speedily complicated with peritonitis more or less acute, that the symptoms are readily confounded together, and it is impossible to distinguish with certainty the symptoms which are to be referred to peritonitis, and those which result from the affection of the muscular coat. The prostration of strength, the alteration of the features, which often exists from the commencement, the feebleness and rapidity of the pulse, the irregular fœtid state of the lochia, are not such constant symptoms as to be pathognomonic, and may arise from other causes. Hence it will appear that the most attentive consideration of the phenomena will not lead us to any certain conclusion as to

the nature of the affection, and as in many other diseases, we can only determine its precise character by the history of its origin and progress, and by the alterations of structure discovered after death. In all the cases of this affection which I have observed, the resources of nature and of art have proved equally unavailing in arresting its fatal course. The active inflammatory symptoms, which commonly manifest themselves at the commencement of the attack, pass speedily away whatever plan of treatment be adopted, and are rapidly succeeded by symptoms of exhaustion. Where the disease is not complicated with inflammation of the peritoneum, the symptoms are not such as to indicate the necessity for the employment of venesection; and in one case where it was adopted freely, the abstraction of the blood was followed by speedy death. In other cases, where the opposite plan of treatment was had recourse to, the fatal result seemed to be less speedy, though equally certain.

A case of spontaneous rupture of the uterus came under my observation in July 1828, and on dissection, the posterior part of the cervix and body of the organ were found converted into a soft gelatinous pulp. Another case was related by Dr. Merriman to this Society, on the 10th of March 1829, in which the same cause appeared to have given rise to a similar result; and here

not only had the parietes of the uterus undergone this morbid softening, but the spleen, liver, and other viscera were found peculiarly soft in their texture, so that the finger could scarcely be put upon these parts without tearing them.

These facts, with those related by Professor Boër, render it probable that the occurrence of softening of the uterine parietes may occasionally take place during uterogestation, as well as subsequent to delivery.

Cases of inflammation and softening of the muscular or proper tissue of the uterus.

CASE X.

Mrs. D——, Orange Street, Leicester Square, after a severe and protracted labour was delivered of a still-born child, on the 25th of March, 1829. On the 27th, there was exquisite tenderness of the hypogastrium increased by pressure, with fulness and tension of the whole abdomen. The pulse was rapid and feeble. The lochia and milk suppressed. The tongue was dry and furred. Thirst urgent, with constant nausea. Leeches and warm cataplasms were applied to the region of the uterus, and calomel and opium administered every second hour. The pain gradually extended to the whole abdomen, which was enormously distended. The pulse became still more rapid and

feeble. The tongue brown; teeth covered with dark sordes. Incessant vomiting of dark coloured matters, with low muttering delirium, followed, and she sunk on the 4th of April.

Dissection.—The peritoneal surface of the great intestines was remarkably vascular, but no false membrane was observed on any of the abdominal viscera. Several pints of a brown serous fluid were contained in the peritoneal sac; the uterus was large and uncontracted, and its peritoneal coat at the inferior and posterior part was deeply red; its muscular tissue to a considerable extent in this situation, was of a dark ash-grey colour, and so soft as to be lacerated by slight pressure of the fingers. The os uteri at the posterior part was softened and wholly disorganized.

CASE XI.

Inflammation and softening of the muscular coat of the uterus.

On the 7th of September, 1829, I was present at the examination of the body of a lady who had died on the 9th day after delivery, with the ordinary symptoms of low child-bed fever*. Little complaint had been made of pain in the region of

* My friend and colleague, Dr. Henry Davies, was consulted in this case, and it was to his kindness that I enjoyed the opportunity of witnessing this dissection, and of examining the bodies of several other women who had died in the hospital.

the uterus. The pulse was rapid and feeble, the respiration hurried, the tongue loaded, with diarrhœa. Before death the whole surface of the body had assumed a deep yellow colour.

Dissection.—The uterus occupied the brim of the pelvis. The whole peritoneal sac had a healthy appearance, except a small portion covering the posterior part of the body of the uterus, which was red and vascular, but not covered with false membrane. On cutting into the cavity of the uterus, there escaped a dark coloured offensive fluid. The muscular coat under the inflamed peritoneum, where the placenta had adhered, was converted into a soft flocculent substance, readily broken down with the fingers, and this morbid alteration extended near to the peritoneum. Around this disorganized portion of the muscular and internal coats of the uterus, similar changes, though slighter in degree, were observed in these tissues to a considerable distance, and they had a dark livid colour.

The uterine appendages on the right side were also disorganized by inflammation.

CASE XII.

Mrs. Chapman, æt. 36, No. 9, Belton Street, Long Acre. Delivered on the 19th of August, 1830, labour easy. On the 24th, after drinking

freely of porter, was suddenly attacked with a violent rigor, of long continuance, which was succeeded by acute uterine pain, headache, and great frequency of pulse. No remedies of any kind were employed until the 27th, when I was first called to see her. She had been delirious in the night. The pulse 130, soft and compressible: hurried breathing, great prostration of strength. Tongue brown and furred, diarrhœa, surface of the body of a deep sallow colour. The hypogastrium was painful on pressure, the abdomen generally neither swollen nor tender.

The symptoms became aggravated in the night, and she died on the morning of the 28th.

Dissection.—Dr. Sims and Mr. Rice were present. No trace of disease could be detected in the peritoneal coat of the uterus, intestines, or other abdominal viscera, and no effusion of fluid had taken place into the peritoneal cavity.

Both ovaria were enlarged and disorganized, being so softened in consistence as to resemble a rotten pear. Both Fallopian tubes were of a deep red colour, and their cavities were filled with a thin purulent fluid. These morbid appearances were most remarkable in the right uterine appendages. The muscular coat of the greater portion of the body and fundus of the uterus, at the

posterior part, was of a peculiar yellow colour, and so soft, that the point of the fore finger passed through it and the peritoneum covering it, though the parts were dissected out in the gentlest manner. On a careful examination of the uterus, it was found that the whole of the uterine parietes at the posterior part had undergone this morbid change of structure.

IV. Inflammation of the veins, and absorbents of the uterus.

The absorbent vessels of the uterus, and receptaculum chyli were observed by Mr. Cæsar Hawkins, to be filled with fluid pus, in a case of fatal uterine inflammation subsequent to delivery, which occurred in St. George's Hospital in the month of July, 1829. Since that period, I have observed the absorbents in the vicinity of the uterus distended with pus in four cases, and in three of these there existed inflammation and suppuration of the veins. The late valuable researches of Messrs. Tonellè and Duplay have proved that inflammation of the absorbents of the uterus, of the receptaculum chyli and thoracic duct occurs not unfrequently in puerperal women, and gives rise to the same constitutional disturbance as uterine phlebitis.

The presence of purulent fluid in the veins of

the uterus after parturition was pointed out many years ago, by Meckel, Schwilguè, Wilson, and J. Clarke, but none of these authors appear to have been aware of the important fact, which has recently been demonstrated by numerous observations, that a large proportion of the cases usually termed low child-bed fever, or typhoid puerperal fever, arise from inflammation and suppuration of the uterine veins. Exclusive of the cases which have been recorded in the 15th volume of the Transactions of this Society, ten fatal examples of this insidious, and most dangerous affection have fallen under my notice since November, 1829, and from an examination of all these cases it appears that the symptoms of uterine phlebitis correspond in a striking manner with the symptoms assigned by the earlier writers to the putrid puerperal fever, or malignant forms of typhus after delivery.

In the hospitals of Paris much more extended observations than mine have been made by Louis, Andral, and Dance, and it is stated in the Memoir of M. Tonellè, that in 1829, during the prevalence of the fatal epidemic in the Maternité, inflammation of the veins and lymphatics of the uterus occurred in 132 out of 222 cases which were examined after death : and that in 197 cases of the whole, some important alteration of structure was discovered in the uterine organs. M. Duplay has confirmed these observations to the fullest extent,

for he met with eighteen cases of inflamed lymphatics with or without inflammation of the veins, and in all of these the constitutional phenomena were those which characterize phlebitis in other organs of the body and in the other sex.

In a few rare cases described by these pathologists under the term Ataxic Puerperal Fever, the changes which had taken place in the uterine organs, were comparatively slight, and consisted of an exudation confined to the neck of the organ, and a little lymph effused into the cavities of some of the veins. In some of these cases, the symptoms were considerably different from those commonly observed in uterine inflammation, and were probably referrible to other causes *.

* In the anomalous or ataxic form of puerperal fever described by M. Tonellè, there was great irregularity in the progress of the symptoms. The most striking of these were agitation, delirium, and prostration of strength, alternating with one another; frequent syncope, attacks of dyspnœa, temporary disturbance of the circulation and animal temperature, and often with these the symptoms of intense inflammation of the peritoneum or uterus. On examining the bodies after death, scarcely any appreciable lesions were discovered, except those in the veins and about the uterus above mentioned, and none in comparison with the gravity of the symptoms.

A woman who had a tedious and severe labour, which was followed by uterine hemorrhage, was attacked on the third day after delivery with typhoid fever. The labia became affected with gangrene, and she died on the 11th day.

In another case eschars formed on the breasts, sacrum, and

In women who have enjoyed good health during pregnancy, and in whom the process of parturition has been easily accomplished, uterine phlebitis occasionally commences within twenty-four hours after delivery, with pain more or less acute in the region of the uterus, accompanied or followed by a severe rigor, or a succession of rigors, suppression of the lochial discharge, acceleration of the pulse, cephalalgia or slight incoherence of ideas, with an insuperable sensation of general uneasiness, and sometimes by nausea and vomiting. These symptoms after a short duration are succeeded by increased heat of the body, tremors of the face and limbs, rapid feeble pulse, anxious and hurried respiration, great thirst, with brown dry tongue, and frequent vomiting of green co-

labia, the thighs and heels—and the uterine organs were healthy.

A woman delivered on the 29th of August, 1829, was attacked two days after with prolonged fits of cold shivering, which were followed by copious sweats and some abdominal pains. Delirium, with morbid sensibility of the abdomen, succeeded. Urgent diarrhœa: pulse small and frequent, lochia not suppressed. The 4th day, she had syncope and bilious vomitings; the belly became distended, the pains ceased, dyspnœa with great prostration of strength came on, and she died on the 6th day from the attack.

The peritoneum presented a small quantity of limpid serosity and a slight injection confined to the neighbourhood of the uterus, two or three of the veins contained a slightly turbid serosity which appeared to be the rudiment of pus; the lungs were gorged with blood.

loured matters. The sensorial functions usually become much affected, and there is a state of drowsy stupor or violent delirium and agitation, which terminate in exhaustion. The whole surface of the body not unfrequently assumes a peculiar sallow or deep yellow colour, the abdomen becomes swollen and tympanitic and some of the remote organs of the body, the brain, heart, lungs, liver, and spleen, or the articulations and cellular membrane of the extremities suffer disorganization, from a rapid and destructive congestion, inflammation, or gangrene.

At other times, inflammation of the uterine veins commences at a later period after delivery than above mentioned, and in a much more obscure and insidious form, without either pain or sense of uneasiness in the region of the uterus, or any other local symptom by which the affection can be recognized. The uterus may return to its usual reduced volume after delivery, the lochial discharge may continue to flow, and the inflammation and suppuration of the veins, which have caused the whole of the violent constitutional disturbance and destructive lesions in distant parts of the body, may be wholly overlooked during life. In several cases which I shall now relate, this occurred, and wine, opium, brandy, and sulphate of quinine, with other stimulants, were liberally administered by the medical attendants,

to obviate the debility supposed to be caused by a specific fever, without any local affection of the uterine organs.

Inflammation of veins rarely takes place in any part of the body where it cannot be referred to a wound, or to a specific cause, externally applied to the coats of the vessels. In uterine phlebitis the inflammation cannot, it is true, invariably be traced to the orifices of the veins where the placenta adhered to the inner surface of the uterus, yet it scarcely admits of a doubt but that the frequent occurrence of the disease is the effect of the communication indirectly established between the venous system and the atmospheric air from the separation of the placenta after delivery. In consequence of this separation, the uterine veins are placed in a condition analogous to that of the great veins of the extremities after amputation and extensive wounds, which condition experience has proved to be favourable to the production of inflammation; and inflammation being once excited in the vessels, may extend along the continuous membrane of the uterine veins to the spermatic or hypogastric veins, and from thence to the vena cava, and its principal branches returning the blood from the lower extremities.

"The veins which return the blood from the uterus and its appendages," as I formerly remark-

ed, " may be either wholly or in part inflamed; generally however, and this is a circumstance in the history of uterine phlebitis deserving particular attention, the inflammation attacks the spermatic veins alone, and for the most part, the one only on that side of the uterus to which the placenta has been attached; and it may either confine itself to a small portion of the vessel, or extend throughout its whole course from the uterus to the vena cava. The usual consequences of inflammation of veins are then apparent, viz., injection and condensation of the cellular membrane in which they are imbedded, thickening, induration, and contraction of their coats, and the deposition of lymph mixed with pus and coagula of blood within their cavities.

" The same is the case with regard to the hypogastric veins, one only being generally affected. These veins are, however, rarely inflamed in comparison with the spermatic, and this would seem to depend on the latter veins being invariably connected with the placenta, to whatever part of the uterus it may happen to be attached."* From these facts we have an explanation of the local and constitutional phenomena of phlegmasia dolens, which invariably arises from an extension of the inflammation from the hypogastric to the iliac and femoral veins.

* Med. Chir. Trans. Vol. XV. p. 101.

Though uterine phlebitis be a most dangerous affection, it does not always prove fatal, and that it often occurs in puerperal women where it is never suspected to exist, is demonstrated by the fact, that in the spermatic and hypogastric veins of females advanced in life, calcareous concretions, and disorganizations of various kinds, have frequently been observed, which must have been the consequence of attacks of acute inflammation at remote periods.

Cases of uterine phlebitis.

CASE XIII.

Mrs. Hickson, a middle aged woman, delivered in the British Lying-in Hospital, on the 14th of November, 1829. On the 3d of December, the day before her death, I first saw her. The hypogastrium was swollen and tense, and on the right side exquisitely painful on pressure. The pulse was 130, and feeble; respiration hurried. The countenance sunk; great prostration of strength. The tongue covered with a dark brown fur; nausea, and urgent thirst. The conjunctiva of both eyes, and the whole surface of the body of a deep yellow tinge. The milk, which was sparingly secreted, was observed to be of the same colour. I was informed that this patient had a very good labour, but that retention of urine took place a few days after she had complained of some pain in the

right side, which was relieved by leeches. She afterwards went on tolerably well, and was up and about till the middle of the third week. She took porter and animal food eagerly till within two days of her death.

The body was removed from the Hospital to Little Brook Street, Hanover Square, where it was examined on the 8th of December.

The peritoneal surface of the abdominal viscera appeared at first sight in a healthy state, and the uterus had undergone the usual reduction of volume, at the same period after delivery. The uterine appendages on the right side were found adhering to the caput coli and to the peritoneum near the brim of the pelvis, by a firm false membrane. The veins proceeding from the right side of the fundus uteri to the spermatic were filled with pus, and the coats of the right spermatic veins, to an extent of three inches from the uterus were greatly thickened, and the cavity obstructed with lymph and pus. The veins in the left superior angle of the uterus also contained pus, and two small purulent deposits were found immediately under the peritoneum in the same situation.

Upwards of a pint of pure pus was contained in the cellular membrane at the brim of the pel-

vis on the right side, and had passed down into the cavity exterior to the peritoneum, as low as the neck of the bladder. The mucous membrane of the bladder near its cervix was intensely red, and partially coated with a thin false membrane of an ash-grey colour.

CASE XIV.

Mrs. Messlin, æt. 22, a patient of the British Lying-in Hospital, delivered on the 13th of January 1830, after a natural labour. During the whole of the following day she complained of an unusual sense of chilliness, with vertigo and slight head-ache.

15th Jan. She now complains of acute pain in the left side of the chest, with confined respiration and cough. There is also great tenderness in the region of the uterus, the body of the uterus is felt above the brim of the pelvis, large, and hard, and pressure over it produces exquisite suffering. Pulse above 100, full, and soft. Countenance flushed ; skin hot. Lochia and milk suppressed. V. S. ad ℥xvi. Hirud. xxiv. Calomel and opium every second hour.

16th. The uterine pain was immediately relieved by the bleeding, but it returned again in the night, when fourteen ounces more were drawn from the arm.

In the afternoon the abdomen was considerably distended, but soft. The uterus still large, hard, and painful on pressure. Pulse rapid and feeble; great prostration of strength. Has been drowsy and oppressed since the morning, and makes no complaint but of distressing sickness at stomach.

During the 17th, the abdomen became more distended; the pulse more rapid and feeble, and she sunk on the morning of the 18th, the fifth day after delivery.

Dissection.—The lungs on the left side gorged with blood, pleura healthy. The caput coli and transverse arch of the colon were preternaturally vascular, and here and there covered with patches of lymph. The uncontracted uterus filled the brim of the pelvis. The peritoneum of the anterior part of the fundus and body of the uterus, was of a dusky red colour, and the veins at both superior angles of the uterus were gorged with pus. The spermatic and hypogastric veins on both sides were healthy. The muscular tissue at the anterior and superior part of the uterus, where the placenta had adhered, was reduced to a soft, red coloured, flocculent pulp.

Both ovaria were much enlarged, vascular, soft, and their parenchymatous structure infiltrated

with pus and lymph. Both Fallopian tubes were of a red colour, and contained pus in their cavities.

On the 16th of January, three days after the occurrence of the last case, another patient in the hospital was attacked the day after delivery with rigors, head-ache, and great tenderness of the uterus, with diminished lochial discharge. The pulse was 110, and weak; skin hot; the countenance pale and depressed. The abstraction of ℥xx. of blood from the arm, and the application of twenty-four leeches to the hypogastrium were followed by immediate relief of all the symptoms.

Another case occurred on the same day, which yielded to similar treatment.

CASE XV.

On the 19th of January, 1830, with Mr. North of Upper Berkeley Street, I examined the body of a woman in Portman Mews, who had died twelve or fourteen days after delivery. It was stated by her medical attendant that the labour had been natural, and that she continued well till the fifth or sixth day after delivery, when tenderness of the abdomen came on, with fever, which soon assumed a low typhoid type. The pulse was rapid and feeble, and the tongue brown and

parched. Sulphate of quinine and stimulants were liberally administered, but the symptoms assuming a more unfavourable character, Mr. North was called to see her. A puffy swelling of considerable magnitude had appeared over the left wrist, and another in the right thigh, about the middle.

Dissection.—A copious sero-purulent effusion into the abdominal cavity. The uterus larger than usual at the same period after delivery. The peritoneum, covering its anterior part, highly vascular, and covered with a thick albuminous layer. The veins proceeding from the left superior angle of the uterus, left ovarium, and Fallopian tube were fully distended with a purulent sanious fluid. The coats of the left spermatic vein, throughout its whole course, were greatly thickened and contracted; the lower half of the inner surface of the vein was lined with false membranes, and the cavity partially filled with pus. The superior half was blocked up with firm coagula of blood. The muscular tissue of the fundus uteri to a considerable extent on the left side was of a dull yellow colour, but the part preserved its natural consistence. The veins on the right superior portion of the uterus were filled with pus. The right spermatic and both hypogastric veins were healthy.

CASE XVI.

Mrs. Cox, æt. 19, Mary-le-Bone Street, St. James's, was delivered after a severe and protracted labour on the 1st of December, 1829.

On the 5th she experienced an attack of acute pain in the right side of the hypogastrium, with rigors, sickness at stomach, and diminution of the lochia. Eight ounces of blood were removed from the arm, and leeches applied to the region of the uterus, after which the pain entirely subsided.

On the 7th (the 6th day after delivery), the pulse 130 and feeble. The countenance sunk. Constant drowsiness or dozing, from which she was roused with difficulty. The abdomen soft, tumid, and no where painful on the strongest pressure. Tongue dry; occasional vomiting; bowels open.

8th. Vomiting continues. Tongue foul; great thirst. She now complains of pain on pressure in both iliac fossæ. Abdomen generally soft and puffy. Pulse 140 and extremely feeble. Great prostration of strength.

From the 9th to the 11th, when she died, she was affected with a drowsy stupor, and occasional delirium.

Dissection.—Peritoneal surface of uterus healthy. At the left superior angle were several small abscesses, under the peritoneum, and in the muscular tissue of the uterus. The veins here contained pus. The placenta had adhered to the corresponding part of the inner surface. The ovaria were soft, and greatly enlarged. To the left the Fallopian tube was adherent. The internal structure was converted into a dark red coloured, pulpy substance. The right ovarium had undergone a similar change.

CASE XVII.

Inflammation of the right spermatic vein after parturition, the peritoneal and parenchymatous tissues of the uterus healthy.

Mrs. Gilland, 30 years of age, was delivered in the British Lying-in Hospital on the 24th December, 1829. The labour was natural, and she had previously enjoyed good health.

On the 28th December, the 4th day after her confinement, she had slight rigors, with headache, but made no complaint of uneasiness in any part of the abdomen. Headache, giddiness, with remarkable prostration of strength, and rapid feeble pulse, were the only symptoms observed until the 6th of January, the day I first saw her.

She was then perfectly conscious, and did not

complain of pain in the head, or of vertigo. The face was flushed, the eyes red. Considerable tremors were observed in the muscles of the face, tongue, and extremities: the articulation was indistinct. The pulse 150, and extremely feeble. Respiration hurried. Tongue dry and brown: thirst urgent. The bowels open. The abdomen was considerably distended, but not tympanitic. Firm pressure over the right side of the hypogastrium produced great uneasiness, though no unusual tension was perceived in this situation.

7th January. Constant dozing in the night without delirium. Face more flushed and eyes suffused. Tongue parched. Teeth and lips covered with dark sordes. Slight tenderness on pressure in both iliac regions. Abdomen more distended. Bowels open. Pulse rapid and feeble. Tremors of the muscles much increased.

8th January. Has been comatose in the night. Aggravation of all the symptoms. Sunk in the evening.

The body was removed from the Hospital to No. 3, Great White Lion Street, where it was examined by me on the 10th January, with Drs. Sims and Hamilton.

Dissection.—The uterus had undergone the usual reduction of volume, and at first no morbid

change could be discovered in any of the abdominal viscera, the whole peritoneal sac presented a perfectly healthy appearance, with the exception of a slight adhesion between the right ovarium and Fallopian tube by an effusion of lymph. The veins of this ovarium and Fallopian tube, and the right spermatic vein throughout its whole course, were contracted and lined with an adventitious membrane, and partially filled with lymph and pus. The mouth of the spermatic vein was nearly closed, and the inner surface of the vena cava, about an inch above and below, was covered with shreds of flocculent albumen. The placenta had been attached to the posterior surface and right side of the uterus, but no trace of inflammation could be perceived in the vessels of this or any other part of the muscular tissue of the organ.

CASE XVIII.

Inflammation of the absorbent vessels and appendages of the uterus.

Mrs. Wall, æt. 32, No. 89, Berwick Street. Delivered of her second child on the 1st of Nov., 1830. Labour protracted from deformity of the brim of the pelvis. On the morning of the 2nd of November, the day after delivery, she was attacked with acute pain of the uterus, with complete suppression of the lochia, and febrile symptoms. The uterus could be felt preternaturally large and

hard in the hypogastrium, and very tender on pressure. The other parts of the abdomen were soft and flaccid, and not affected by pressure. The pulse was 100, soft and compressible. A pint of blood taken from the arm was followed by syncope and great relief of uterine pain. Eight leeches were applied to the hypogastrium, and calomel and antimonial powder administered every fourth hour. Warm cataplasms were applied over the leech bites.

3d November. Pain of uterus now produces little uneasiness, except when pressure is made over the hypogastrium. The uterus can still be felt unusually large and hard above the brim of the pelvis. Pulse extremely rapid and feeble. Countenance pale and dejected. She is now affected with somnolence to so great a degree that she can scarcely be roused.

She became gradually more feeble and sunk in the night.

Dissection.—Two pints of a dark brown serous fluid in the sac of the peritoneum. The right ovarium enlarged to the size of a hen's egg, the surface of a bright red colour, and imbedded in lymph, its structure disorganized, the whole presenting the appearance of a soft cyst, distended with a purulent and gelatinous fluid. The left

ovarium had lost all traces of its natural form and texture, being reduced to a broken down flocculent pulp. The absorbents of the uterus, on the left side and in the left broad ligament were filled with pus. The veins and muscular structure were healthy.

The appearances of the ovaria in this case have been faithfully represented in the drawings presented to the Society.

From the time that the British Lying-in Hospital was re-opened in the course of last summer, for the admission of patients, no case of uterine inflammation occurred until the month of December, when the three following fatal examples of the disease were observed.

CASE XIX.

Mrs. Sexton, 30 years of age. Delivered on the 19th of December, 1830. Labour natural. On the 21st had a severe rigor followed by great tenderness of the region of the uterus; headach and suppression of the lochia. Pulse 115, full and strong. Tongue white. Thirst. V. S. ad ℥xx. Hirud. xxxvi. hypogastrio. Hydr. Submur. gr. iij. Opii gr. ¼. 4ta. q. q. hora.

22nd December. Blood cupped and buffed. Sensibility of the uterus but little diminished.

Lochia and milk suppressed. Countenance of a dusky yellow hue. Pulse 115 and feeble.

23rd December. Abdomen enormously distended, tympanitic, and exquisitely painful on pressure. Pulse rapid and feeble. Tongue foul; urgent thirst. Somnolence and delirium. Died in the night. Permission could not be obtained to examine the uterus, but the symptoms led to the belief that the peritoneum and deeper seated tissues were inflamed.

CASE XX.

Veins and absorbents of the uterus inflamed.

Mrs. Jones, æt. 24. On the 21st December, twenty-four hours after delivery, was suddenly attacked with sickness, vomiting, and severe headache, and rigors. Lochia suppressed. Soreness of the hypogastrium and both iliac regions; features collapsed; hurried breathing; pulse 120 and feeble.

On the 22nd, the pain appeared to undergo a remission in consequence of the remedies employed, but it again became aggravated, as well as all the other symptoms, and she died on the 24th.

Dissection.—The placenta had been attached to the left side of the fundus uteri, and the veins at

this part of the uterus were lined with dark coloured false membranes, and gorged with pus. The lymphatics of the left broad ligament were distended with purulent fluid. Both ovaria were enlarged, and reduced to a soft flocculent pulp.

The Fallopian tubes were both red and vascular, and their cavities full of pus. The peritoneal coat of the uterus at the posterior part was inflamed, and about four ounces of yellow serum were effused into the pelvis. A few inflamed patches were observed on the peritoneal surface of the small intestines.

CASE XXI.

Inflammation and suppuration of both spermatic veins.

Cecilia Boyd, æt. 31, No. 32, Peter Street, was admitted into the Hospital on the 25th of December, but the labour pains having been feeble and irregular, they were considered spurious, and she was allowed to return to her home after two days. On the 28th, the pains suddenly became so violent that she could not leave her own residence, where she was delivered. The labour was natural.

On the 31st of December, she was attacked with pain in the uterus, rigors, and occasional delirium. Rapid feeble pulse. Countenance pallid. The

abdomen was tumid and soft. The hypogastrium and iliac fossæ painful on pressure.

January 1st. Complete remission of pain, except on firm pressure over the region of the uterus. Constant dozing. Pulse 140. Tongue brown and dry in the centre.

2nd. The symptoms have undergone little change. Still complains of no uneasiness except on pressure. Drowsiness and delirium continue.

3rd. Suddenly seized with excruciating pain of the abdomen and distressing flatulence. The belly became distended. Pulse rapid, feeble, and irregular, and she died on the 4th.

The abstraction of eight ounces of blood from the arm, at the onset of the attack produced complete syncope. In this case mercurial frictions, and calomel and opium internally were employed to a great extent.

Dissection.—Abdomen distended with gas. Six ounces or more of red serous fluid in its cavity. Peritoneal sac not inflamed except that portion covering the posterior surface of the uterus, and its appendages. The cellular tissue connecting the peritoneal with the muscular coat, at the back of the cervix uteri infiltrated with pus, as

well as that between the folds of the broad ligaments, on both sides. Both spermatic veins contained pure pus in considerable quantities, as did also the venous branches at the angles, and inferior portions of the uterus. The Fallopian tubes enlarged and vascular. The muscular structure of the uterus healthy. No appearance of pus was observed in the orifices of the veins at the part to which the placenta had been attached.

CASE XXII.

Inflammation of the veins, absorbent vessels, and muscular tissue of the uterus.

Mrs. Holding, a middle aged woman, residing at No. 4, Marshall Street, a patient of the Middlesex Hospital, was delivered on the 18th of December, 1830.

On the 21st became affected with extreme soreness of the region of the uterus, repeated attacks of cold shivering, headache, thirst, and suppression of the lochial discharge.

The uterus was large, hard, and exquisitely tender on pressure. The other regions of the belly were soft, flaccid, and wholly free from pain on the strongest pressure. The pulse 130. Countenance pale. Tongue white.

On the 22d and 23rd. Incessant vomiting.

Great prostration of strength. Respiration hurried. Pulse feeble and intermitting. Pain of abdomen gone.

Died in the afternoon.

Dissection.—Intestines distended with air. Peritoneal coat of the intestines, fundus and anterior part of the uterus healthy. The peritoneum covering the posterior part of the uterus, and upper part of the rectum coated with false membrane. Both ovaria large and softened to a pulp. The left highly vascular in the centre; the surface of the right covered with lymph. The substance of the uterus at the superior and anterior part, more particularly where the placenta had been attached, so soft as to be readily torn with the fingers and of a dusky yellow colour. The veins at the lower part of the uterus, on the left side filled with pus. The absorbents of the left superior angle, broad ligament, and Fallopian tube also filled with it*.

* Three fatal cases of uterine phlebitis have been observed by me, since this communication was presented to the Society. The symptoms did not differ from those observed in the preceding cases. A fourth example of the disease has occurred in the practice of the Southwark Lying-in Institution, the history of which has been communicated to me, by Dr. Stephen Hall, of Walworth. The placenta being attached over the os uteri, delivery was accomplished by turning on the 5th of May. Until the 11th (the 8th day after her confinement) she seemed to recover favourably, when she was attacked with severe

Causes of uterine inflammation.

The *causes* of uterine inflammation in puerperal women, are generally involved in great obscurity. In some cases the disease is distinctly referrible to the injury inflicted on the uterus by severe protracted and instrumental labour, by the forcible introduction of the hand into the uterus, exposure to cold and various irregularities of diet soon after delivery. But most frequently, it arises where none of these causes have been applied, and where we are compelled to refer it to some peculiar constitution of the atmosphere, or to contagious miasmata.

It is a point of the utmost practical importance to determine, how far contagion is to be considered as a cause of the disease; the writers on puerperal fever are however completely at variance on this subject. Dr. Hulme maintains that it is not

diarrhœa. The pulse was 150. The tongue dry and furred, great thirst and heat of skin. No pain in any part of the abdomen. During the seven following days the debility was excessive, and every night there was a rigor followed by copious sweats.

The right spermatic vein from its junction with the vena cava, to its ramifications immediately before entering the uterus, irregularly enlarged to the size of a man's little finger, and of a florid red colour. When laid open it was found filled with pus, a portion of which flowed into the vena cava when the spermatic was pressed, and also through the openings into the uterus: the coats greatly thickened. The other abdominal and pelvic viscera perfectly healthy. The left spermatic also healthy.

more contagious than pleuritis, nephritis, or any other inflammatory disease, and M. Tonellè, who has recorded the history of the most fatal epidemic which has ever occurred in Paris, asserts that contagion was clearly out of the question there, for in the Maternité the women who were newly delivered had each a separate apartment, and yet were attacked with the disease, while in the sick ward of the hospital, no instance of the propagation of puerperal fever ever occurred.

The evidence of M. Dugès, against the doctrine of contagion is still more strong, for he observes, "Nous avons vu mainte et mainte fois des femmes enceintes sejourner dans l' infirmerie environnées de peritonite, sans en prendre le germe ; nous avons vu plus souvent encore dans les infirmeries des femmes recemment accouchées arriver avec une maladie quelconque et ne point contracter la maladie regnante, malgrè les miasmes qui les entouraient; et si quelques examples contraires s'etaient presentés, il eut été trop simple et trop naturel de les expliquer en pareil cas par une infection differente de la contagion des maladies à miasmes virulents.

"Jamais une élève sage-femme chargée du soin de deux femmes à la fois n'a transporté de la femme malade à la femme saine la peritonite, comme on dit l' avoir vu à Londres : et jamais cette

inflammation ne s'est propagée de proche en proche dans les rangs des salles destinées aux femmes bien portantes."

The sentiments of M. Baudelocque accord with those of M. Dugès and Tonellè on the non-contagious nature of the disease*.

In the earlier descriptions however of uterine inflammation or puerperal fever, it is referred not only to the corrupted atmosphere of hospitals, but to contagion. In the Dublin Lying-in Hospital, Edinburgh Infirmary, the General Hospital at Vienna, and in most of the Lying-in Hospitals of this metropolis, it has raged with great violence at different periods as an epidemic, and has appeared to be propagated by contagion. Dr. Gordon, of Aberdeen, states that the disease prevailed chiefly or wholly in the practice of particular midwives, and most of the cases observed by Dr. Armstrong at Sunderland, occurred in the practice of one surgeon and his assistant.—Dr. John Clarke observes: "It is hardly possible to prove that it is not infectious, but it has also arisen, as far as we can judge, as an original disease in private practice where there had been no communication with infected persons."†

* Baudelocque sur la Peritonite Puerperale, p. 128, 8vo. Paris, 1830.

† Dr. J. Clarke, on the Epidemic Disease of Lying-in Women, 1787 and 1788.

It is difficult to reconcile this contradictory evidence, and the facts I have myself observed, though they have inclined me to adopt the opinion that the disease is sometimes communicable by contagion, yet they have not been sufficiently numerous, and of so decisive a character as to dispel every doubt on the subject. In many cases it has occurred in the most destructive form, where the idea of contagion could not be entertained.

In the last two weeks of September 1827, five fatal cases of uterine inflammation, came under my observation. All the individuals so attacked had been attended in labour by the same midwife, and no example of a febrile or inflammatory complaint of a serious nature occurred during that period, among the other patients of the Westminster General Dispensary, who had been attended by the other midwives belonging to the institution.

On the 16th of March 1831, a medical practitioner who resides in a populous parish in the outskirts of London, examined the body of a woman who had died a few days after delivery from inflammation of the peritoneal coat of the uterus.—On the morning of the 17th of March, he was called to attend a private patient in labour, who was safely delivered the same day. On the 19th she was attacked with the worst symptoms of uterine phle-

bitis; severe rigors, great disturbance of the cerebral functions, rapid feeble pulse, with acute pain of the hypogastrium and peculiar sallow colour of the whole surface of the body. She died on the 4th day after the attack, the 22d of March, and between this period and the 6th of April, Mr. —— attended two other patients, both of whom were attacked with the same disease in a malignant form and speedily fell victims to it.

On the 30th of March, it happened that the same gentleman, was summoned to a patient, a robust young woman seventeen years of age, affected with pleuritis, for which venesection was resorted to with immediate relief.

On the 5th of April there was no appearance of inflammation around the puncture, which had been made in the median basilic vein, but there had been pain in the wound during the two preceding days. The inner surface of the arm from the elbow nearly to the axilla was now affected with erysipelatous inflammation. Alarming constitutional symptoms had manifested themselves: the pulse 160; tongue dry. Delirium had been observed in the night.

On the evening of this day, the inflammation had spread into the axilla. The arm was exquisitely painful, but in the vicinity of the wound,

which had a healthy appearance, the colour of the skin was natural, and no hardness nor pain was felt in the vein above the puncture.

On the 6th, patches of erysipelatous inflammation had appeared in various parts of the body, the upper and inner surface of the left arm, and in the sole of the left foot, all of which were acutely painful on pressure. The inflammation of the right arm had somewhat subsided. The pulse was 140. The tongue brown, dry, and furred. Restlessness, constant dozing, and incoherence: when roused she was conscious. The countenance cold, heat of the surface irregular.

The 7th, pulse rapid, countenance anxious, teeth and lips covered with sordes, somnolence and delirium. The left arm above the elbow was acutely painful and very much swollen. The right was but little painful, and the erysipelas had made no further progress. The patches of erysipelas on the forehead and sole of the foot had disappeared, but there was a slight blush of inflammation on the inner side of the calf of the left leg. The symptoms became aggravated and she died on Saturday the 9th April.—I examined the body with Mr Prout on the 11th, and the following morbid appearances were observed.

The wound in the median basilic vein was

open, and its cavity was filled with purulent fluid. The coats of this vessel and of the basilic vein, to its termination in the axillary vein, were thickened, so as to resemble the coats of an artery. The inner surface of these veins was redder than natural, and at the upper part had lost its usual smoothness, but there was no lymph deposited upon it. The mouths of the veins entering the basilic were all closed up with firm coagula of blood or lymph. The cellular membrane along the inner surface of the arm was unusually vascular and infiltrated with serum. This infiltration was to a much greater extent along the situation of the erysipelatous inflammation of the left arm, but the veins of this arm were perfectly healthy. The abdominal viscera were sound.

Whatever conclusion we may arrive at, on the contagious or non-contagious nature of the disease commonly termed puerperal fever, it cannot affect the view which I have taken of its proximate cause, or essential nature, for the symptoms, morbid appearances, and effects of remedies, all prove, whatever the nature of the remote cause may be, that it acts by exciting inflammation of the uterine organs.

With regard to the nature of this inflammation, it is difficult to determine whether it be of a common or specific kind. It certainly arises where

individuals are not exposed to the ordinary causes of inflammation, and it often reigns as an epidemic particularly in hospitals, and in this respect it resembles hospital gangrene, erysipelas, and other specific inflammatory diseases which are generally supposed to depend on a vitiated state of the atmosphere. Like these diseases too, it ceases without any assignable cause perhaps for several years, and then reappears in the same establishments and is attended with the same destructive consequences.

Pouteau supposed the inflammation of the uterus to be of an erysipelatous nature, and the same opinion was maintained by Drs. Home and Young of Edinburgh, who saw the disease in the Lying-in wards of the Royal Infirmary. Dr. Gordon observed erysipelas to prevail extensively at Aberdeen in 1795, but he has not inferred from this circumstance that the peritoneal inflammation which he has so accurately described, was of an erysipelatous kind, or different from common abdominal inflammation.

Dr. Abercromby has lately described several cases of peritonitis, which he considered to be allied to erysipelas. The principal pathological character of this affection noticed by him is, that it terminates chiefly by effusion of fluid without much, and often without any of that inflam-

matory and adhesive character of the disease in its more common form. Pinel, Bayle, Gasc, and Laennec, to whom we are much indebted for the knowledge we possess of the anatomical characters of inflammation of the peritoneum, have traced no resemblance between the phenomena of puerperal peritonitis and erysipelatous inflammation, and it is still extremely doubtful if serous membranes are liable to attacks of erysipelas. Dr. Hodgkin has stated to me that the appearances after death in puerperal peritonitis, do not differ from those observed in ordinary peritonitis in the male sex.

In the autumn of 1829, a short time before the epidemic broke out in the British Lying-in Hospital which led to its being closed for several months, two children died of erysipelas. In one of these which I examined after death, there were inflammation and suppuration of most of the branches of the umbilical vein, and extensive peritonitis. Another fatal case occurred in the course of the epidemic, and on examining the abdomen I found the peritoneum extensively inflamed, with a copious effusion of sero-purulent fluid. A few days before the reappearance of the disease in the hospital in December last, an infant died of erysipelas of the external organs of generation and abdomen, and the same diseased state of the peritoneum was observed. Another

infant was attacked with gangrenous erysipelas of the extremity of the right forefinger on the 28th of December, whose mother had been cut off on the 24th by uterine phlebitis. Mr. Blagden has related to me a similar case which occurred in his practice last summer. A midwife of the hospital had a severe attack of erysipelas of the face, a few days after attending in labour one of the fatal cases I have related of inflammation of the absorbents and uterine appendages. No. XVIII. These are certainly remarkable coincidences, but they are not sufficient I conceive to establish the fact, that it is an erysipelatous inflammation which attacks the uterus subsequent to delivery.

At the close of this paper, I have placed an abstract of the histories of 112 cases of uterine inflammation, by which it will be seen, that at one period the inflammation affects chiefly the peritoneal surface of the uterus, whilst at another it affects its deeper seated tissues, and in this respect it resembles some other inflammatory diseases of the internal organs, and particularly of the thoracic viscera, which assume an epidemic form.

It may also be observed from an examination of this abstract, that in the course of a few days, in the same ward of the hospital, and in patients who were placed in contiguous beds during the

prevalence of the epidemic, all the varieties of uterine inflammation which I have described, occurred in their most perfect forms. In some the local and constitutional symptoms were immediately subdued by general and topical blood-letting, but in other cases the symptoms were from the commencement such as to contra-indicate the use of this remedy, and it was not had recourse to. Such cases usually terminated fatally in spite of local bleeding, and the exhibition of internal remedies, and on examination after death the veins, muscular structure, or appendages of the uterus, were found to be the textures most frequently inflamed.

This fact, that at different seasons, different textures of the uterine organs are liable to be affected with inflammation, and in varying degrees of intensity, will enable us in some measure to reconcile the discordant opinions contained in the works of authors, both with respect to the symptoms of puerperal fever, and the treatment required in different epidemics.

Until a recent period, the pathological anatomy of the uterine organs in puerperal women, had not received that attention from physicians, either in this country or on the continent of Europe, which its importance demanded. In the histories of the different epidemic fevers of lying-in wo-

men since the middle of the seventeenth century, the morbid appearances on dissection, though often very imperfectly described, nevertheless strongly confirm the opinion that the whole of their phenomena, local and constitutional, are to be referred to uterine inflammation.

In the epidemic of 1664 in the Hotel Dieu at Paris, it is stated by M. Tenon, that the women were attacked with hemorrhage, and that abscesses were found in their bodies on dissection *.

It was observed by M. Malouin in the epidemic which occurred in 1746, that the uterus became dry, hard and painful, and that it was swollen; and that the lochia had not their ordinary course; that the women were attacked with pain in the situation of the broad ligaments, and that the abdomen was tense. "On opening the bodies, curdled milk was found on the surface of the intestines; a milky serous fluid in the hypogastrium: the same fluid was found in the thorax of certain women, and when the lungs were cut, they discharged a milky and putrid lymph. The stomach, the intestines, the uterus when carefully examined, appeared to have been inflamed. According to the physicians there escaped clots (des grumeaux) on opening the vessels of this viscus."†

* Tenon Mémoire sur les Hospitaux de Paris, p. 241.

† Mémoires de l'Academie des Sciences, 1746.

M. Tenon observes in his Memoir on the Hospitals of Paris, that in all the epidemics which occurred from the year 1774 to 1816, during which time the disease had become as it were naturalized, it was successively observed to occur in a simple and curable form, and in another form in which it was complicated and uncontrolled by any remedy.

"The constant symptoms of the simple puerperal fever are the following: rigor, pain, at first slight, in the region of the kidneys, intestinal colic, affecting in a few hours the whole hypogastrium, and gradually becoming more acute. Pulse concentrated, fever moderate, lochia not suppressed, mammæ flaccid. Tongue dry in the middle, covered with a yellow mucus on the edges, hiccup and vomiting of green coloured matters.

"In the complicated puerperal fever, the fever is stronger, with exacerbations, the tongue is black and dry, the belly is tense, distended, and tympanitic, and but slightly painful. In some women the lochia have been either wholly suppressed, or only diminished in quantity, others have experienced attacks of *ophthalmia*, others a red eruption on the arms, or the abdomen; in some the respiration was difficult, in general the blood shewed the buffy coat.

"On opening the abdomen, the stomach, the intestines, particularly the small intestines, were inflamed, adhering to one another, distended, filled with air and a yellow fluid matter. The uterus was contracted to its ordinary dimensions; it was seldom found inflamed. I had occasion to dissect two, in one the uterus contained a coagulum of blood, an infiltration of a milky appearance, or like whey, in certain women existed in the cellular membrane which surrounds the kidneys, sometimes also a thick white cheesy matter was met with. We neither observed those purulent deposits, nor those hemorrhages, which had been observed in the epidemic of 1664, and the uterus was not found dry, hard, and tumified as in 1746. In the epidemic of 1774 the lochia flowed; this did not flow in 1746."

Pinel, Bichat, Laroche, and Gardien, found the peritoneum inflamed in so many fatal cases of puerperal fever, that they have considered it to depend essentially on peritonitis. An eminent French author who has subsequently observed the disease, and who entertains the same views of its inflammatory nature, declares that nothing can be more absurd, more chimerical, or contrary to the spirit of analysis and observation, than the idea of a puerperal fever, that is to say, a fever essential or peculiar to a woman recently delivered.

The bodies of fifty-six women were examined who had died in the General Hospital at Vienna in the autumn of 1819 of puerperal fever, and in all of these, with the exception of two cases, where delivery had taken place some time previ us to death, effusions of sero-purulent fluid were found in the abdominal cavity, and traces of inflammation in one or more of the abdominal viscera. The ovaria and Fallopian tubes were always more or less swollen, red, and tender, and the body of the uterus was always, in consequence of inflammation, flabby, tender, and easily broken down with the finger. It is also stated in the report of the epidemic, that the accession of fever is always preceded by marked changes in the whole system and particularly in the uterus, clearly indicating an inflammatory state. The symptoms were such that the inflammation combined with high fever could not be mistaken *.

If we consult the works of the most celebrated writers in this country on puerperal fever, it will clearly appear that they all describe the disease, as commencing with sense of soreness, or exquisite tenderness, in the region of the uterus, and that where it proves fatal, the appearances on dissection are those which afford the most unequivocal proofs of inflammation of the pelvic and abdominal viscera. Dr. William Hunter says " The uterus, all

* Medical Annals of the Austrian States, 1822.

the viscera, and every other part are found inflamed. There is a quantity of purulent matter in the cavity of the abdomen, and the intestines are all glued together." The account of the morbid changes of structure by Drs. Hulme, Joseph Clarke, Gordon, Campbell, Mackintosh, and others, is nearly the same, and Dr. Hamilton, who believes that puerperal fever is a fever *sui generis*, nevertheless admits that the appearances on dissection are exactly similar to the descriptions generally given by these authors, and that acute pain of the abdomen is a primary, and not a secondary symptom of the disease. Dr. H. positively affirms, that puerperal fever is a disease of a putrid or typhoid nature, requiring for its treatment, wine, volatile alkali, bark, glysters, and animal jellies; and yet in direct opposition to his theoretical views, and as if involuntarily led by the symptoms to a correct conclusion respecting the true character of the affection, he has laid down as the first indication of treatment "to moderate local inflammation by purging and hot fomentations."

Dr. John Clarke admits that in most cases of the true epidemic puerperal fever, there has been some degree of inflammation in the cavity of the abdomen, and that the uterus and ovaria sometimes partake of the inflammation. In two cases which he met with there was an appearance of pus in the veins of the uterus. The brain was always

in a natural state. In one instance only was there an appearance of disease in the chest. The effusion of sero-purulent fluid into the sac of the peritoneum, was so disproportioned however to the degree of inflammation, that he supposed it to arise from another cause than inflammation. It is now however admitted by all pathologists, that these copious effusions into the peritoneal sac, are invariably the result of acute inflammation of the peritoneum, and not of any peculiar disposition of the vessels of the part affected, as Dr. Clarke had supposed.

Dr. Gooch, the latest author of observations on puerperal fever in this country, has accurately described the symptoms and treatment of puerperal peritonitis. As a substitute for the ordinary names, child-bed fever, puerperal fever, and peritonitis, he has employed the term peritoneal fever "to express the fact that an affection of the peritoneum is an essential accompaniment of the disease, without defining what that affection is, because it is not uniform." This term peritoneal fever is perhaps the least appropriate that Dr. Gooch could have invented, for he admits that the disease may occur in its most exquisite form and yet leave few or no traces in the peritoneum after death, by which we might have been enabled to determine that this membrane had previously been the seat of the disease

"The most remarkable circumstance," Dr. Gooch observes, "which the experience of the last few years has taught us about peritoneal fevers is, that they may occur in their most malignant and fatal form, and yet leave few or no vestiges in the peritoneum after death. The state of this membrane indicated by pain and tenderness of the abdomen, with a rapid pulse, appears to be not one uniform state, but one which varies so much in different cases, that a scale might be formed of its several varieties; this scale would begin with little more than a nervous affection, often removeable by soothing remedies, and when terminating fatally, leaving no morbid appearances discoverable after death. Next above this, a state in which this nervous affection is combined with some congestion, indicated in the cases which recover, by the relief afforded by leeches, and in the cases which die, by slight redness in parts of the peritoneum, and a slight effusion of serum, sometimes colourless, sometimes stained with blood. Above this might be placed those cases, in which there are in the peritoneum, the effusions of inflammation without its redness, namely, a pale peritoneum, and no adhesions, lymph like a thin layer of soft custard, and a copious effusion of serum rendered turbid by soft lymph. Lastly, the vestiges of acute inflammation of the peritoneum, viz. redness of this membrane, adhesion of its contiguous surfaces, a

copious effusion of serum, and large masses of lymph."*

In investigating the morbid anatomy of this class of diseases, Dr. G. appears to have been satisfied with simply inspecting the serous surface of the uterus; now I am strongly inclined to believe, from what I have myself observed, and from the authorities I have quoted, that if he had gone behind the peritoneum and carefully examined the spermatic and hypogastric veins, the absorbents, the uterus and its appendages, with the sub-peritoneal tissues, he would frequently have found the products of acute inflammation. The absence of increased vascularity of the peritoneum, and of lymph and serum in its sac, does not prove, that the subjacent tissues are in a healthy state. That a nervous affection, or congestion of the peritoneum, should give rise to all the symptoms and consequences of fatal uterine inflammation, is not only highly improbable, but is wholly unsupported by proof.

Dr. Gooch affirms that symptoms and dissections cannot settle the question. "The effects of remedies on a disease," he remarks "if accurately observed, form the most important part of the history. They are like chemical tests, frequently detecting

* An Account of some of the most important Diseases peculiar to Women, by Robert Gooch, M.D.

important differences in objects which previously appeared exactly similar. Symptoms and dissection," he adds, "can never do more than suggest probabilities about the nature of a disease and the effects of a remedy on it." "A trial of the remedies themselves is the only conclusive proof."

I might appeal to the works of all the eminent writers on puerperal fever, since the middle of the 17th century to prove the fallacy of this opinion, and it would be easy to shew from the contradictory statements they contain respecting the results of the various modes of treatment adopted, that we must have remained for ever ignorant of the true nature of this disease, if we had reasoned from the effects of remedies alone, without the study of symptoms, and morbid changes of structure.

That diffused pain of the abdomen with a rapid, soft pulse, not unfrequently occurs, at particular seasons, without inflammation, or with a very slight degree of inflammation, in delicate nervous women after parturition, and that these symptoms are relieved by opiates and warm fomentations, without either general or local blood-letting, will readily be admitted. That such cases are however, if not essentially different in their nature, at least widely different in degree of severity, from cases of sporadic or epidemic puerperal fever or uterine

inflammation, is clearly proved by the following observation of Dr. Gooch himself. "There seemed to be nothing dangerous in this form of disease, provided the nature of it was not mistaken, and improper remedies not used, yet it so strikingly resembled peritoneal inflammation that it was invariably taken for it by the practitioners who witnessed it." The results of the practice in the Westminster Lying-in Hospital in the years 1828 and 1829, still more decidedly prove that the cases described by Dr. Gooch were not cases of low childbed fever, for of twenty-eight women who were attacked with the disease and were treated, as he had recommended, with Dover's powder, and warm cataplasms, seven died, or one in four.

Treatment of uterine inflammation.

Like inflammation of other organs of the body that of the uterus varies greatly in severity in different cases, and at different seasons. At some periods there is a marked disposition to the disease, evinced by tenderness of the uterus on pressure, and acceleration of the pulse, where inflammation is not actually developed, or where it takes place in so slight a degree as to yield readily to anodyne remedies exhibited internally, and to local applications of a soothing nature to the hypogastrium. Professor Chaussier was so convinced of the advantages and of the necessity of a continued and

gentle perspiration to prevent and to combat puerperal peritonitis, that he made every woman recently delivered take from time to time, and at intervals more or less distant, small doses of Dover's powder, and applied emollient cataplasms to the abdomen.

Where inflammation of the peritoneal covering of the uterus is fully developed, and where the disease is prevailing in an epidemic form, this treatment will prove wholly insufficient to arrest the progress of the affection, and unless blood-letting and the other means for subduing visceral inflammation be vigorously employed, it will in most cases proceed to a fatal termination.

In no inflammatory disease, are the good effects of blood-letting more strikingly observed than in the first variety of uterine inflammation, puerperal peritonitis; we do not however, as Dr. Gordon has stated, possess a remedy in it which will certainly cure the disease in all cases if early applied. Where the symptoms of peritonitis manifest themselves with great violence, twenty ounces of blood should be immediately drawn from the arm, and in a few hours, if relief is not obtained, ℥xvi more should be abstracted. The first general bleeding should be followed without loss of time by the application of leeches to the abdomen, regulating their number by the severity of the pain,

and the strength of the pulse. Warm lintseed meal poultices, or fomentations to the hypogastrium should invariably follow the application of the leeches; and five grains of calomel with an equal quantity of antimonial powder should be administered every two or three hours. After the second dose of this medicine, I have frequently exhibited a strong purgative draught, repeating it according to its effect. It will often be found, that the pain of the uterus continues with considerable severity after this treatment has been pursued; and that the most decided benefit results from combining half a grain or a grain of opium, or five grains of Dover's powder, with each dose of the calomel and antimony.

Where the symptoms do not indicate an attack of a formidable nature, we ought not to carry depletion so far. In a large proportion of cases, one bleeding will prove sufficient, and in many the application of leeches alone, with the internal remedies now mentioned, have subdued the disease.

Oil of turpentine I have seen employed in a few cases without the slightest advantage.

Emetics have been administered in puerperal peritonitis, and favourable reports have been published of their effects both by French and English authors. From the intense pain of the uterus how-

ever, aggravated by the slightest pressure of the hand, or by compression of the abdominal muscles, and from the early occurrence of nausea and vomiting in the worst cases of the disease, emetics obviously appear to be little calculated for the relief of the symptoms. The first favourable report of the effects of emetics was given by M. Doulcet, of Paris, in 1780, and it has been copied by almost all the English writers down to the present period, and has been considered as affording unequivocal proof of the power of these remedies to arrest the disease.

Doulcet commenced the employment of ipecacuan and kermes mineral in the month of June, 1782, according to Alphonse Le Roi, when the epidemic was ceasing. But these means were wholly inefficacious in the months of November and December, for the mortality was greater at this epoch, and at the beginning of the following year, than in 1780, when the remedy of Doulcet was not known; and M. Tenon affirms, that the complicated puerperal fever in 1786 was curable by no means then discovered.

With regard to the treatment of inflammation of the uterine appendages, and of the deeper seated tissues of the uterus itself, whether of the absorbents, veins, or of the muscular structure, the symptoms from the commencement are generally

those which contra-indicate the use of general blood-letting. In cases where the reaction at the invasion of the disease has been violent, with acute pain of the uterus, and venesection has been employed, the relief obtained has only been temporary, if at all experienced; and in some instances the abstraction of only a few ounces of blood from the arm has produced syncope, or been followed by rapid sinking. Where the local pain is severe, leeches and warm fomentations seem to be the appropriate remedies; but as far as my own observations go, we are in possession of no remedial means which effectually controul those varieties of inflammation of the deeper seated structures of the uterus, which I have attempted to describe. The French physicians are however of a contrary opinion, and are satisfied that we possess a powerful remedy, even in the worst cases, in mercury, employed so as to excite salivation. In one case of uterine phlebitis, I pushed this remedy by inunction to a great extent, and brought the system under the influence of mercury in less than twenty-four hours; yet the progress of the symptoms was not arrested, and the patient died, as I had observed others do where the remedy had not been administered. In other cases I have employed mercury to a great extent internally, without the slightest benefit; and it may justly be doubted from the results of M. Tonellè's practice, whether or not it possesses

the influence he supposes, for of forty-three cases where mercury was used as the chief remedy, only fourteen recovered.

I cannot conclude this subject, which is unquestionably the most important in obstetrical medicine, without pointing out the necessity which there exists for a full investigation of the means best calculated to prevent the occurrence of uterine inflammation in Lying-in Hospitals, where its dreadful fatality has been recorded by all writers since the foundation of these institutions. From the Registers of the British Lying-in Hospital, Maternité at Paris, the Dublin Lying-in Hospital, and the Tables of M. de Chateau Neuf, it is proved that the average rate of mortality greatly exceeds that of establishments where individuals are attended at their own habitations; and if it should ultimately appear, that all precautions are unavailing in diminishing the numbers attacked with the disease, it will then become a subject deserving of serious consideration, whether Lying-in Hospitals should not be considered upon the whole more injurious than beneficial to society.

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